Amprobe Celebrates

50

Years of Excellence

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All products manufactured by **AMPROBE** are Year 2000 compliant.

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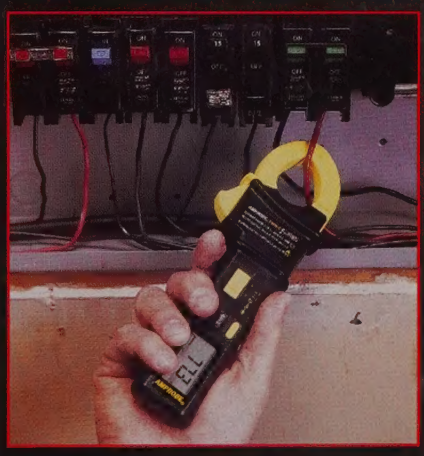
ISO 9002 System Certified



DIGITAL AC & AC/DC

CLAMP-ONS

Digital AC/DC Clamp-Ons		ACD-1	ACD-10 Ultra	ACD-10TRMS	ACD-11	ACD-12	ACD-2	ACD-2000A	ACD-2001A	ACD-330T	ACD-3A	ACD-4A	ACD-7A	ACD-8A	ACD-9A	ACDC-1000A	ACDC-3000	ACDC-600A	ACDC-600AT	ACDC-610	ACDC-620T	DLC-100
AC Volts (VAC)	to 400																					X
	to 600		X	X		X				X						X						
	to 750				X												X			X		
	to 1000	X		X			X	X	X		X	X	X	X	X						X	
DC Volts (VDC)	to 400				X																	
	to 600															X						
	to 1000									X	X		X	X	X					X	X	
AC Amps (ACA)	to 100																					X
	to 300						X		X			X	X	X								
	to 400		X	X		X																
	to 600																	X	X	X		
	to 1000	X			X			X		X	X				X	X	X				X	
AC Milliamps(ACMA)																						X
True RMS				X				X	X	X							X		X		X	
DC Amps(DCA)	to 600																	X	X	X		
	to 1000															X	X				X	
Frequency response(Hz)	50/60				X	X																
	40-400	X	X				X				X	X	X	X	X	X		X	X	X		
	up to 2kHz			X				X	X	X						X	X			X	X	X
Resistance		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X
Audible Continuity			X	X	X	X				X							X			X	X	X
Temperature																					X	
Frequency Measurement(Hz)										X							X			X		
Peak Hold		X					X	X	X	X	X	X		X	X	X	X			X	X	
Data Hold			X	X	X	X				X							X			X	X	X
Bargraph										X							X				X	X
Capacitance(uF)																					X	
UL Approved			X	X		X				X							X				X	
CE Approved			X	X	X	X				X							X	X	X	X	X	
Backlit Display																	X					
Dynamic Recording										X							X				X	X
Auto Power Off			X	X		X				X							X			X	X	X
Auto Ranging			X	X	X	X	X	X	X	X	X	X				X	X				X	
Testmaster Kit Available		X				X	X	X														
Catalog Page Number		6	8	8	9	10	6	18	18	11	6	6	7	7	7	17	19	13	13	14	15	22

ACD-1, 2, 3A & 4A

USA

ACD-1

USA

ACD-4A

FEATURES

- LCD (3A & 4A) or LED (1, 2)
- Average sensing (3A & 4A) or Peak sensing (1 & 2)
- Press-to-read button locks "on"
- Measures low resistance such as motor windings
- "Continuous" or "Peak" readings
- Measures motor starting currents and other peaks or surges
- Over-range and low battery indications
- Auto ranging and function selection
- Fused ohmmeter - ACD-1 & 2 fuse protected to 600V; ACD-3A & 4A PTC protected to 600V ACD-1 & 2 perform diode test with 1.2V ohmmeter test voltage
- Extendo-type test leads with replaceable probe tips
- Withstands momentary overloads up to 50%

Models ACD-1 and ACD-2 are "Peak" sensing instruments calibrated to read out in RMS and have a red LED display. Models ACD-3A and ACD-4A are average-sensing instruments calibrated to read out in RMS and have an LCD display.

SPECIFICATIONS

Model	AC Voltage Ranges & Accuracy	AC Current Ranges	Accuracy AC Current Based on Sinusoidal Waveform	Resistance Range & Accuracy	Operating Frequency	Extendo Leads Standard	Display	Zero Adjust	Jaw Size	Weight
ACD-1	0.1-999 ±2% rdg ± 1 LSD	0.1-999 C 0.1-999 P	±2% rdg ± 1 LSD	0.1-999Ω ±2% rdg ± 1 LSD	25-400Hz	Yes	7/16" LED	Automatic except Ω	2" 5.08cm	15 oz 425 g
ACD-2	0.1-999 ±2% rdg ± 1 LSD	0.1-300 C 0.1-999 P	±2% rdg ± 1 LSD	0.1-999Ω ±2% rdg ± 1 LSD	25-400Hz	Yes	7/16" LED	Automatic except Ω	1" 2.54cm	11 oz 312 g
ACD-3A	0.1-999 ±2% rdg ± 1 LSD	0.1-999 C 0.1-999 P	±2% rdg ± 2 LSD	0.1-1999Ω ±2% rdg ± 1 LSD	40-400Hz	Yes	0.4" LCD	Automatic except Ω	2" 5.08cm	15oz 425 g
ACD-4A	0.1-999 ±2% rdg ± 1 LSD	0.1-300 C 0.1-999 P	±2% rdg ± 2 LSD	0.1-1999Ω ±2% rdg ± 1 LSD	40-400Hz	Yes	0.4" LCD	Automatic except Ω	1" 2.54cm	11oz 312 g

Operating Temperature/Humidity: 32°F to 120°F, 85% RH.
Case Voltage Breakdown Test: 3000 Volts AC
Sampling Rate: ACD-1/2-4 times/second; ACD-3A/4A-2.5 times/second
Fuses: 8AG-360-X023 (600V), 1 amp fast blow.
Power: 1 No. MN 1604, 9V alkaline battery or equal (not supplied).
Peak Response: ACD-1 & 2, 0.08 seconds; ACD-3A & 4A, 0.09 seconds.
Size: ACD-1 & ACD-3A 8-15/16"h x 2-5/8"w x 1-19/32"d (21.1cm x 6.7cm x 4.1cm); ACD-2 & ACD-4A 7- ½"h x 2-5/8"w x 1-19/32"d (19.1cm x 6.7cm x 4.1cm).
Included Accessories: ACD-1 & ACD-3A is supplied with AE carrying case, DTL-2 leads; ACD-2 & ACD-4A is supplied with AE-2 carrying case, DTL-3 leads; all models are supplied with OHB-4HE ohmmeter attachment (w/fuses) and one VRC-320 clip adaptor.
Test Master Kits: One of the ACD digital clamp-ons combined with "Energizer", model A-47L, in a deluxe carrying case, Model ADM, gives you a professional test kit with extra testing capability.

Model TACD-1: Includes ACD-1, A-47L, DTL-2 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.
Model TACD-3A: Includes ACD-3A, A-47L, DTL-2 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.
Model TACD-2: Includes ACD-2, A-47L, DTL-3 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.
Model TACD-4A: Includes ACD-4A, A-47L, DTL-3 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.

ACCESSORIES

Amptran 50:1 (5000A) transformer	CT50-1
Amptran 50:1 (3000A) transformer	CT50-2
Standard carrying case for ACD-1, ACD-3A	AE
Standard carrying case for ACD-2, ACD-4A	AE-2
All-weather test leads with replaceable probe tips for ACD-1, ACD-3A	DTL-2
All-weather test leads with replaceable probe tips for ACD-2, ACD-4A	DTL-3
Fuse for OHB-4HE Probe	8AG-360-X023
Battery	MN1604
Energizer w/Adaptor ADP45/46	A47L
Ohmmeter Adaptor	OHB-4HE
Deca-Tran (600A Transformer)	A50-1
Instruction Book	P/N 920750

ACD-7A, 8A & 9A

FEATURES

- Models ACD-8A and 9A can display peak inrush or surge currents
- Accuracy ±2% ± 1 LSD of reading based on Sinusoidal Waveform
- Measures motor starting currents & other surges or peaks
- Over-range and low battery indication
- Circuit protection on resistance ranges
- Withstands momentary overloads
- 10 Megohm impedance on voltage ranges
- Data "HOLD"

Models ACD-7A, 8A, 9A will measure AC current, AC voltage, DC voltage and resistance. All models are average sensing, RMS calibrated in the continuous mode. Models ACD-8A & 9A are peak sensing RMS calibrated when switched to the peak mode. High and low ranges can be changed by momentarily pressing the red button on the left side. The range can also be locked in by pressing and turning the red button counter clockwise.

ACD-8A

SPECIFICATIONS

Resolution: "0.1" on low range, "1" on high range
Sensing: Average
Power: One No. MN1604 9V alkaline battery (not supplied)
Operating Temperature/Humidity: 32°F top 120°F (0°C to +49°C) 80% RH
Storage Temperature/Humidity: 20°F to 140°F (-6° to 60°C) 80% RH
Case Voltage Breakdown Test: 3000 VAC
Input Impedance: 10 Megohmns on voltage ranges
Sampling Rate: Minimum of 2 times/second
Response Time: 2.5 seconds maximum
Peak Response Time (ACD-8A & 9A only): 0.08 seconds
Peak Decay: (ACD-8A & 9A only): not more than 4 LSD/min.
Fuse: 1 No. 8AG-360x023 One Amp Fast Blow (supplied)
Circuit Protection: All voltage and current ranges are protected for 50% overload for a maximum of one minute.

Ohmmeter Test Voltage: 2.0V max., open circuit
Battery Life: 200 hours minimum
Display: 3-1/2 digit LCD, 0.4"high with maximum reading of 1999
Size: ACD-7A & 8A –7-1/2"x 2-5/8"x1-19/32" (19.1cm x 6.7cm x 4.1cm)
ACD-9A - 8-15/16" x 2-5/8" x 1-19/32" (21.1cm x 6.7cm x 4.1cm)
Models ACD-7A & 8A are supplied with AE-2 carrying case and DTL-3 leads.

ACD-9A is supplied with AE carrying case and DTL-2 leads.

All models ACD-7A/8A/9A are supplied with OHB-4HE ohmmeter attachment (with fuse) and one VRC-320 clip adaptor.

odel	AC & DC Voltage Ranges	AC Current Ranges	Resistance Range & Accuracy	Current & Voltage Accuracy Based on Sinusoidal Waveform	Operating Frequency	Extendo Leads Standard	Display	Zero Adjust	Jaw Size	Weight
D-7A	0-199.9/999	0-199.9/300	0-199.9/1999Ω ±2% rdg ± 1LSD	±2% rdg ± 2 LSD Amps ±2% rdg ± 1 LSD Volts AC ±0.75% rdg ± 1 LSD Volts DC	40-400Hz	Yes	0.4" LCD	Automatic	1" 2.54 cm	11 oz 312 g
D-8A	0-199.9/999	0-199.9/300C 0-300P	0-199.9/1999Ω ±2% rdg ± 1LSD	±2% rdg ± 2 LSD Amps ±2% rdg ± 1 LSD Volts AC ±0.75% rdg ± 1 LSD Volts DC	40-400Hz	Yes	0.4" LCD	Automatic	1" 2.54cm	11 oz 312 g
D-9A	0-199.9/999	0-199.9/999C 0-999P	0-199.9/1999Ω ±2% rdg ± 1LSD	±2% rdg ± 2 LSD Amps ±2% rdg ± 1 LSD Volts AC ±0.75% rdg ± 1 LSD Volts DC	40-400Hz	Yes	0.4" LCD	Automatic	2" 5.08 cm	15 oz 425 g

Continuous P = Peak LSD = Least Significant Digit

Test Master Kits: One of the ACD digital clamp-ons combined with "Energizer", model A-47L, in a deluxe carrying case, Model ADM, gives you a professional test kit with extra testing capability.

Model TACD-8A: Includes ACD-8A, A47L, DTL-3 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.

Model TACD-9A: Includes ACD-9A, A-47L, DTL-2 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.

ACD-9A

ACCESSORIES

Standard carrying case for ACD-9A	AE
Standard carrying case for ACD-7A, ACD-8A	AE-2
Deluxe Carrying Case	ADM
All-weather test leads with replaceable probe tips for ACD-9A	DTL-2
All-weather test leads with replaceable probe tips for ACD-7A, ACD-8A	DTL-3
Fuse for ACD-7A, ACD-8A, ACD-9A	8AG-360-x023
Battery with adapter	MN1604
Energizer includes ADP 45 & 46	A47L
Alligator clip adaptor for DTL-2 & DTL-3	VRC-320
OHMS Adapter	OHB-4HE
Replacement probe tips for DTL-2 & DTL-3	VPT
Instruction Book	P/N 932758
AMPRTRAN® flexible link 50:1 transformer	CT50-1
AMPRTRAN® flexible link 50:1 transformer	CT50-2

ACD-10 ULTRA/ACD-10 TRMS

ACD-10 TRMS

FEATURES

Amprobe's most popular digital clamp-on series just got better. The ACD-10 ULTRA and ACD-10 TRMS offer a reliable, affordable, and easy to use solution for AC Amperage, AC Voltage, and Resistance/Continuity measurements. The model ACD-10 TRMS accurately measures True RMS AC current to a crest factor of 2.5 on lines containing non-linear loads or where harmonics may be present. The ACD-10 ULTRA is average sensing. The unique teardrop jaw allows measurement of current in confined spaces possible up to a maximum of 400A RMS. These units can measure AC Voltage to 600V RMS and Resistance to 40kΩ and cover just about any application a tradesman can find. Safety is built in from overload protection on all ranges right down to the integrated hand guard. The protective holster, model HT-13Y, is standard on the ACD-10 TRMS and optional on the ACD-10 ULTRA (order model ACD-10H ULTRA for ULTRA with holster). Each unit comes complete with 9oft Vinyl Carrying Case (SV-16), Test Leads (DTL-12) and Instruction Manual.

- Teardrop Jaw Design
- True RMS Measurement (ACD-10 TRMS)
- Average-Sensing (ACD-10 ULTRA, ACD-10H ULTRA)
- ACA to 400A
- ACV to 600V
- Resistance to 40kΩ
- Continuity Buzzer
- Auto Ranging

SPECIFICATIONS

Type of Display: 3-3/4 digits LCD, 4000 count
Size of Digits: 0.5"
Over-range Indication: "O.L."
Low Battery Indication: In Display,
Functions: AC Amps, AC volts, Ohms, Continuity Hold
Function Select: Slide Switch (4 Positions)
Ranging: Auto
Ranging Point: 390 ±5 counts
AC Conversion Type: Ultra: Average Sensing RMS indication.
TRMS: AC, Volt, and Amp Conversions are AC coupled, true RMS responding. Basic accuracy is for sine wave. For non-sine wave accuracy refer to*

***Crest Factor:**	1.4 to 2.0 add 1.0% to Accuracy 2.0 to 2.5, add 2.5% to Accuracy
AC volts:	0-400, 400-600 (40-500Hz) *Resolution:* 0.1V for 0-400V, 1V for 400-600V *Overload Protection:* 600 Vrms *Input Impedance:* 10 Megohms // less than 100 pF *Accuracy:* 1.2% of rdg. ±5 LSD
AC Current:	0-400 Amps (40-500Hz) Resolution: 0.1 Amp Overload Protection: 420 Amps RMS Accuracy: 1.9% of rdg. ±5 LSD 0-400A (50/60Hz)
Ohms:	0-4KΩ; Resolution 1Ω 0-4KΩ; Resolution 10Ω Accuracy: 1.9% of rdg. + 8 LSD
Ohms/Continuity:	Circuit Protection 600Vrms for one minute by PTC.
Continuity Buzzer:	<230Ω (approximate)
Hold Function:	Separate button on side. No decay in reading.
Power Supply:	9V battery (NEDA 1604, IEC 6F22)
Measurement Rate:	4 times per second minimum
Maximum Jaw Opening:	1.18" (30mm)
Response Time:	Not more than 3.5 seconds with no more than 3 LSD fluctuations.
Temperature Coefficient:	0.2 x (spec. acc'y)/°C, <18°C or >28°C
Drop Proof:	4 feet
Maximum Altitude:	6561 ft. (2000m)
Operating Temp:	32°F to 113°F (0°C to 45°C) <80% RH
Storage Temp:	-4°F to 140°F (-20°C to 60°C)
Weight:	0 oz. (250 g.)
Size:	3.03" (W) x 7.67" (L) x 1.42" (H) (77mm x 195mm x 36mm)
Battery Life:	Alkaline - 200 Hrs.
Case Breakdown:	3000 Volts AC
Auto-Power Off:	Approx. 20 minutes

Designed to meet the following Safety Standards: UL3111-1, CAN/CSA-C22.2 No. 1010.1-92, (indoor use).

Insulation Coordination: Installation Category III 300V, IEC 1010 Category II 600V, Pollution Degree 2

ACD-11

FEATURES

- Ohmmeter circuit protection to 550 Volts
- Safety leads
- Autoranging
- Over-range and low battery indication
- Data hold button
- Large, easy to read 1/2 inch LCD display
- Wrist strap and removable belt clip
- 9V battery, carrying case, and test leads included
- Continuity test with buzzer indication
- Average sensing - RMS calibrated

ACD-11

SPECIFICATIONS

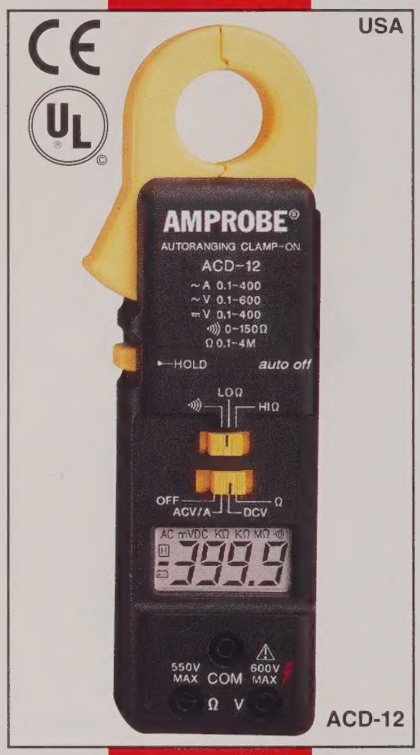
Type of Display:	3 3/4 digits LCD
Size of Digits:	0.5"
Over-range Indication:	"0.L"
Low Battery Indication:	In Display
Functions:	AC Amps, AC Volts, Continuity/Ohms, Hold
Function Select:	Slide Switch (4 positions)
Ranging:	Auto
Ranging Point:	390 ± 5 counts
AC Volts:	0-400, 400-750 (40/500 Hz)
Resolution (Volts):	0.1V for 0-400V, 1V for 400-750
Overload Protection:	850 VAC max.
Input Impedance:	10 Megohms
Resolution (Amps):	0.1 amp (on instrument lower range)
Amps Overload Protection:	1100A for one minute
Continuity with Buzzer:	0-100 Ohms
Ohms:	200Ω to 40KΩ; accuracy ± 2% of reading ± 5 LSD
Ohms/Continuity:	Circuit Protection 550 VAC for one minute by PTC.
Hold Function:	Separate button on side
Power Supply:	9V battery
Measurement Rate:	4 Times per second minimum
Response Time:	Not more than 3.5 seconds with no more than 3 LSD fluctuations
Ohms Open Circuit Voltage:	<1 volt.
Maximum Jaw Opening:	2.14" (54.5mm)
Operating Temp/Humidity:	32°F (0°C) to 120°F (49°C) 80% RH
Storage Temp/Humidity:	20°F (-6°C) to 140°F (60°C) 80% RH
Size:	8-7/8" x 2-3/4" x 1-3/8" (22.54cm x 6.98cm x 3.50cm)
Battery Life:	More than 180 hours
Case Breakdown:	3000 Volts AC

Model	AC Voltage Ranges	AC Current Ranges	Resistance Range & Accuracy	Volts & Amps Accuracy (Based on Sinusoidal Waveform)	Operating Frequency	Extendo Leads Standard	Display	Jaw Size	Weight
ACD11	0-400/400-750	0-400/400-1000	200Ω to 40KΩ ±2% of reading	1.2% ±3LSD Volts ±2% ± 5 LSD 0-400 Amps	50/60Hz	No	0.5" LCD	1.10" 28mm	8 oz. 226 g
			± 5 LSD	±2.5% ±5LSD 400-1000 Amps	50/60Hz	No	0.5" LCD	2.14" 54.5cm	12 oz. 325 g
LSD = LEAST SIGNIFICANT DIGIT									

ACCESSORIES AND REPLACEMENTS

Deca-Tran	A-50-1
Standard carrying case for ACD-11	SV-1
Soft vinyl zippered pouch for ACD-11	SVPC
Deluxe carrying case	ADM
All-weather test leads for ACD-11	DTL-10
Alligator clip adapter for DTL-10	VRC-320
Battery	MN-1604
Energizer	A47L
Instruction Book (ACD-11)	P/N 963756

ACD-12



FEATURES

- Measures ACV/ACA, DCV, Low/High OHMS, Continuity
- 3 3/4 Digit, 4000 Count LCD Display
- Auto Power Off
- Data Hold
- Auto Ranging
- Drop Proof (5 feet)
- Over-range, Low Battery, Reverse Polarity Annunciators
- Overload Protection On All Ranges
- Accommodates Conductors 1.02" in Diameter
- Includes 9V Battery, Test Leads, Carrying Case and Instruction Manual
- Made in U.S.A.

The Model ACD-12 is an average sensing instrument calibrated to give an RMS readout of a sine wave.

SPECIFICATIONS

Type of Display:	3-3/4 Digits, 4000 Count, LCD
Size of Digits:	0.5"
Over-Range Indication:	"OL"
Low Battery Indication:	"⊟" in Display
Reverse Polarity Indication:	"(-)" in Display, + Implied
Functions:	DCV, ACV, ACA, OHMS, Continuity
Function Select:	Dual Slide Switches
Ranging:	Auto
Ranging Point:	390 ±5 Counts
Continuity with Buzzer:	0-150 OHMS
Measurement Rate:	4 Times per Second Minimum
Auto Power Off:	30 Minutes After Turn On
Display Hold:	Separate Button on Side
Operating Frequency:	50-60Hz
Response Time:	Not More Than 3.5 Seconds with Less Than 3 LSD Fluctuation
Power Supply:	9V Battery
Minimum Jaw Opening:	1.10" (28 mm)
Operating Temperature/ Humidity:	32°F (0°C) to 120°F (49°C), <80% R.H. all ranges except low ohms range: 50°F (10°C) to120°F (49°C)
Storage Temperature:	20°F (-6°C) to 140°F (60°C) <80% R.H.
Weight:	8 oz. (226 g)
Size:	8" x 2 1/2" x 1" (20.32cm x 6.35cm x 2.54cm)
Battery Life:	180 Hours Plus with Alkaline Battery
Case Breakdown Voltage:	3000 VAC
Circuit Protection:	The OHMS/Continuity Functions Are Protected To A Maximum of 550 Volts AC for Up To One Minute By Utilizing A Positive Temperature Coefficient (PTC) Resistor.

DC VOLTS

Ranges	0-400mV	0.4-4V	4-40V	40-400V
Resolution	0.1mV	1mV	0.01V	0.1V

Overload Protection: 500 VDC Max
Input Impedance: 10 Megohms
Accuracy: 1% of Rdg. ±3 LSD

AC VOLTS

Ranges	0-400V	400-600V
Resolution	0.1V	1.0V

Overload Protection: 850 Vac Max.
Input Impedance: 10 Megohms
Accuracy: 1.2% of Rdg. ± 3 LSD

AC AMPS

Range	0-400A
Resolution	0.1A

Overload Protection: 500 Amps for One Minute
Duty: Continuous For Up To 400 Amps
Accuracy: 1.2% of Rdg. ± 3 LSD

LOW OHMS

Ranges	0-400Ω	400-999Ω	1-4KΩ
Resolution	0.1Ω	1Ω	1Ω

Accuracy: 1.5% of Rdg. ±3 LSD

HIGH OHMS

Ranges	0-400KΩ	400K-999KΩ	1-4MΩ
Resolution	0.1KΩ	1KΩ	1KΩ

Accuracy: 1.5% of Rdg. ±3 LSD

ACCESSORIES AND REPLACEMENTS

Energizer (Increases Sensitivity by 10 Times)	A-47L
Deca-Tran	A50-1
Adapter of A-47L male plug	ADP-45
Multi-Temp Temperature Measurement Accessory	TMA-1
Test Leads (Set of 2 - Red & Black)	DTL-12
Carrying Case	SV-12
9-Volt Alkaline Battery	MN-1604
Differential Infrared Temperature Accessory	IR-100
Alligator Clip	VRC-320
Ground Adaptor for A-47L	ADP-46
Extendo Lead Set	ETL-10
Instruction Book	P/N 79000600

ACD-330T

FEATURES

- True RMS AC Current Measurement to 1000A
- True RMS AC and DC Voltage Measurement to 1000V
- Frequency measurement to 1KHz
- Dual Display for Frequency & Current or Frequency & Voltage
- Resistance Measurement up to 4kΩ
- Dynamic Min/Max/Avg. Recording
- PEAK Hold (1ms response)
- Designed to conform to UL, ULc, TUV, CE, IEC Standards
- Overload Protection On All Ranges
- Auto/Manual Ranging
- Auto Power Off
- Sleep Mode
- Data Hold
- Audible and Visual Continuity Indicator
- Fully Annunciated 4000 Count 4 Digit LCD
- Auto Relative/Zero Reference Button
- Low Battery Indicator
- Drop Proof
- Diode Check
- 12 Segment Analog Bargraph

ACD-330T

ELECTRICAL SPECIFICATIONS
(23°C±5°C, RH<80%)

DC VOLTAGE

Range	Resolution	Accuracy	Overload Protection
400V	0.1V	±(1%rdg+3dgt)	1000V AC RMS
1000V	1V		

***Input Impedance: 10MΩ**

AC VOLTAGE (TRUE RMS: From 10% to 100% of range)

Range	Resolution	Accuracy 45Hz~400Hz	Overload Protection
400V	0.1V	±(1.5%rdg+3dgt)	1000V AC RMS
1000V	1V		

***Input Impedance: 10MΩ // less than 100pF Crest factor: <3:1**

PEAK VOLTAGE (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Overload Protection
400V	0.1V	±(1.5%rdg+43dgt)	1000V AC RMS
1000V	1V		

Specified accuracy +/-40 digits for changes > 1ms in duration.
***Input Impedance: 10MΩ**

PEAK CURRENT (1 ms PEAK HOLD)

Range	Resolution	Accuracy
400A	0.1A	±(2%rdg+43dgt)
1000A	1A	±(2%rdg+43dgt)

Specified accuracy +/-40 digits for changes > 1 ms in duration.
Overload Protection: 1000 Vrms: <1,000,000 VxHz

AC CURRENT (TRUE RMS: From 10% to 100% of range)

For true RMS current measurement, the specification is based on the symmetric wave current.

Range	Resolution	Accuracy			Maximum Overload
		45 ~ 65Hz	65 ~ 400Hz	400 ~ 1kHz	
400A	0.1A	±(1.2% +5dgt)	±(2.0% +5dgt	±(4.0% +5dgt)	1000A RMS
400 ~ 700 A	1A	±(1.5% +5dgt)	±(3.0% +5dgt)	±(5.0% +5dgt)	
700 ~ 1000 A	1 A	±(2.5% +5dgt)			

*Crest factor: <3:1

RESISTANCE

Range	Resolution	Accuracy	Maximum Test Voltage	Overload Protection
400Ω	0.1Ω	±(1%rdg+3dgt)	3.3V	600V RMS
1000Ω	1VΩ		1.25V	

*In continuity mode, built-in buzzer sounds when resistance is less than 10.0Ω

WARNING:

The measuring duty cycle should not exceed the following limits:

0 ~ 600 A RMS	Continuous
600 ~ 700 A RMS	10 minutes ON, 10 minutes OFF
700 ~ 1000 A RMS	5 MINUTES on, 20 minutes OFF

ACD-330T (cont'd.)

FREQUENCY (AC coupling / Auto-ranging)

Range	Resolution	Accuracy	Minimum Input Frequency
100Hz	0.01Hz	±(0.2%rdg+4dgt)	10Hz
1kHz	0.1 Hz		

*Overload protection: 1000Vrms: < 1000000 V x Hz

FREQUENCY COUNTER SENSITIVITY	
INPUT RANGE	MINIMUM SENSITIVITY (RMS SINEWAVE)
(Maximum input for specified accuracy = 10 x Range or 1000V)	40 Hz-1 kHz
400A	3A
1000A	30A
400V	3V
1000V	30V

DIODE CHECK

Range	Resolution	Accuracy	Test Current	Test Voltage
Diode →|←	1mV	±(1.0%rdg+2dgt)	approx. 1.65mA	<3.3V

*Overload protection: 600V RMS

AUDIBLE CONTINUITY TEST

Range	Resolution	Accuracy	Test Current	Test Voltage
•))	0.1Ω	Built-in buzzer sounds when reading is below approx. 10Ω	approx. 1.65mA	<3.3V

*Overload protection: 600V RMS

GENERAL SPECIFICATIONS

Conforms to UL3111-1, C22.2 NO. 1010.1-92 and EN61010 (IEC1010-1, IEC-1010-2-031, IEC-1010-2-032). Installation Category (Over-voltage Category) II 1000V and Installation Category III 600V, Pollution Degree 2 environment.

Display: Fully annunciated 4 digit, 4000 count liquid crystal display (LCD). Dual display in Temperature mode. 12 segments analog bar graph. Automatic polarity indication.

Measuring Rate: 3.3 times per second (V, A, Ω and Diode tests) 1 ~ 2 seconds per time for frequency.

Low Battery Indicator: Annunciates when battery voltage drops below 7V (approx.).

Operating Temperature: 0°C to 50°C (32°F to 120°F), 0-80% R.H.

Storage Temperature: -20°C to 60°C (-4°F to 140°F), 0-80% R.H. with BATTERY REMOVED

Temperature Coefficient: 0.12%/°C (from 0°C to 18°C or 28°C to 50°C) 0.067%/°F (from 32° to 64.4°F or 82.4°F to 122°F)

Power Supply: Single standard NEDA1604, JIS006P, IEC6F22 carbon zinc or alkaline type 9V battery. Amprobe Model MN1604

Max. Jaw Opening: To accommodate circuit cables 2.04" (52mm)

Dimension: 32mm (H) x 64mm (W) x 273mm (L); 1.26" (H) x 2.52" (W) x 10.74" (L)

Weight: 860 grams with battery (1.9 lbs. with battery)

ACCESSORIES

Description	Amprobe P/N
Safety Test Leads (included)	DTL-3000
Carrying Case (included)	CC-ACDC
9 Volt Alkaline Battery (included)	MN-1604
Instruction Manual (included)	978762

AC/DC-600A & 600AT

FEATURES

- AC and DC **current** only measurements to 600 amps
- Full annunciated LCD display
- Data hold freezes display reading
- Accommodates conductors 1.33" in diameter or .78" x 1.56" bus bars
- Compact size
- Low battery indicator and over-range indicator
- Auto power OFF
- Complete with 9V battery, wrist strap and SV-600 carrying case

Model AC/DC-600AT is a TRUE RMS measuring instrument used for accurate measurement of loads with distorted waveforms or systems suspected of having harmonics.

Model AC/DC-600A is an average sensing instrument calibrated to display the RMS value of a sine wave.

AC/DC-600AT

SPECIFICATIONS

Display: 3-3/4 Digit Liquid Crystal Display (LCD), 2000 count

Polarity: "–" indicated, "+" implied

Over-range Indication: "1" or "-1" only displayed

Measuring Rate: 2 times per second

Position Error: +/- 1% of reading

Type of Sensor: Hall Effect Device

Low Battery Indicator: "[-+]" is displayed when the battery voltage drops below the operating voltage

Operating Temperature: +32°F thru +120°F <75% R.H. (0°C thru +50°C)

Storage Temperature: -4°F thru +140°F, <80%R.H. (-20°C thru +60°C)

Power Supply: Single 9V battery, (NEDA 1604A or IEC 6LF22).

Battery Life: 40+ Hours typical (alkaline)

Max. Conductor Size: 1.33 inches (34mm Dia.) or .78 x 1.56 inches (20mm x 40mm) bus bar

Size: 2.34" (W) x 7.92" (L) x 1.13" (H) or 60mm (W) x 203mm (L) x 29mm (H)

Weight: 11 oz. (310g)

Accuracy: +(1% reading + number of digits) at 23°C ±5°C less than 75% R.H.

Case Breakdown Voltage: 3000V AC/DC

Frequency Response: 40Hz - 400Hz for sine wave (or crest factor = 1.4 - 2.0 ACDC-600AT)

Data Hold: Hold display reading for all functions and ranges

Temperature Coefficient: 0.2 x (spec. Acc'y) /°C, <18° or >28°C

FUNCTION	READING	RESOLUTION	ACCURACY
DCA	0-20A	0.1A	±(1.9% rdg+5dgt)
	20A-200A	0.1A	±(1.9% rdg+3dgt)
	200A-600A	1A	±(1.9% rdg+3dgt)
ACA	0-20A	0.1A	±(1.9% rdg+7dgt)
	20A-200A	0.1A	±(1.9% rdg+5dgt)
	200A-600A	1A	±(1.9% rdg+5dgt)

ACCESSORIES

Carrying Case	SV-600 or SV-1
Battery (9V)	MN-1604
Instruction Book	P/N 974750

AC/DC-610

FEATURES

- 3-3/4 Digit LCD display, (4000 count)
- Measures ACV/ACA, DCV/DCA, ohms/continuity
- Frequency counter
- Peak hold to measure motor start or surge currents
- Data hold freezes display reading
- Auto power OFF
- Over-range indicator, low battery indicator
- Full annunciated display
- 9V battery, carrying case, test leads and instruction manual included

The model AC/DC-610 is an average sensing instrument, calibrated to display the RMS value of a sine wave.

AC/DC-610

SPECIFICATIONS

Type of Sensor:	Hall Effect Device
Type of Display:	3-3/4 digits - LCD
Size of Digits:	0.5"
Auto Power Off:	30 minutes after turn on
Over-range Indication:	"OL"
Ohmmeter Test Voltage:	1.70 VDC
Low Battery Indication:	
Case Voltage Breakdown:	3000V AC/DC
Measurement Rate:	4 times per second minimum
Peak Response Time:	0.08 seconds
Peak Decay Rate:	2 digits max.
Frequency Response:	40-400 Hz
Response Time:	Not more than 3.5 seconds
Polarity:	Automatic "(–)" negative indication, + implied
Continuity with Buzzer:	0-150Ω ±10%
Frequency Counter:	Coupling -AC; Signal Level - 100mV sine wave, 30 mV peak square wave
Input Impedance:	10 Megohms
Power Supply:	9 Volt Alkaline
Battery Life:	More than 180 hours
Maximum Jaw Opening:	1.65" (4.2 cm)
Maximum Operating Temperature/Humidity:	32°F (0°C) to 120°F (49°C) 80% RH
Size:	9" x 2-1/2" x 1-1/4" (22.9cm x6.4cm x3.7cm)
Weight:	14.8oz (419g.)
Functions:	DCV, ACV, ACA, DCA,OHMS/CONTINUITY, FREQUENCY COUNTER, PEAK HOLD, DATA HOLD
Circuit Protection:	The frequency and OHMS/Continuity functions are protected to a maximum of 550 volts for not longer than one minute.

FUNCTION	RANGE	RESOLUTION	ACCURACY	OL PROTECTION
ACV	0-400	0.1	±1.25% ±4 LSD	850VRMS
40-400 Hz	0-750	1.0	±1% ±4 LSD	850VRMS
DCV	0-400	0.1	±0.7% ±2 LSD	1100V
	0-1000	1.0	±0.7% ±2 LSD	1100V
ACA 40-400 Hz	0-400	0.1	±2.0% ±4 LSD	750 Amps for not more than 1 min.
	400-600	1.0		
DCA	0-400	0.1	±2.0% ±2 LSD	750 Amps for not more than 1 min.
	400-600	0.1		
PEAK HOLD	LO	0.1	±1.5% ±5 LSD	1100 VOLTS 700 AMPS
	HI	1.0		
OHMS	0-4K	1.0	±1% ±2 LSD	550V AC/DC for 1 min.
FREQUENCY COUNTER	0-4M Hz Auto Ranging	1 Hz	±0.7% ±3 LSD	550V AC/DC for 1 min.

ACCESSORIES

Amptran 50:1 (5000A) transformer (AC only)	CT50-1
Amptran 50:1 (3000A) transformer (AC only)	CT50-2
Deca-Tran (AC only)	A50-1
AC/DC-610 Carrying Case	SVPC
Test Leads	DTL-10
Battery (9V)	MN-1604
Alligator Clips	VRC-320
Energizer (increases sensitivity by 10 times AC or DC)	A-47L
Male Plug Adaptor for A47L	ADP-45
Ground Adaptor for A47L	ADP-46
Instruction Book	P/N 964758

AC/DC-620T

FEATURES

- True RMS AC and DC Current Measurement to 1000A
- True RMS AC and DC Voltage Measurement to 1000V
- Capacitance Measurement up to 4000 µF
- *Single, Dual, and Differential Temperature Measurement up to 2502°F (1372°C)
- Dual Display of Temperature in both Celsius and Fahrenheit
- Resistance Measurement up to 4kΩ
- Dynamic Min/Max/Avg. Recording
- PEAK Hold (1ms response)
- Designed to conform to UL, ULc, TUV, CE, IEC Standards
- Overload Protection On All Ranges
- Auto/Manual Ranging
- Auto Power Off
- Sleep Mode
- Data Hold
- Audible and Visual Continuity Indicator
- Fully Annunciated 4000 Count 4 Digit LCD
- Auto Relative/Zero Reference Button
- Low Battery Indicator
- Drop Proof

* Requires one or more optional type K thermocouple model TPK-56 and single type-K adapter model TAC-DMM or Dual type-K adapter model DKTA-620. Refer to the accessory section for complete information on supplied and optional items.

AC/DC-620T

ELECTRICAL SPECIFICATIONS
(23°C±5°C, RH<80%)

DC VOLTAGE

Range	Resolution	Accuracy	Overload Protection
400V	0.1V	±(1%rdg+3dgt)	1000V
1000V	1V		AC RMS

***Input Impedance: 10MΩ**

CAPACITANCE

Range	Resolution	Accuracy	Overload Protection
400µF	0.1µF	±(3%rdg+4dgt)	600V
4000µF	1µF	±(3.5%rdg+4dgt) >2mF, NO Spec.	RMS

With film capacitor or better, use Relative mode to zero residual.

Temperature coefficient: 0.15 x specified accuracy / °C (from 0°C to 18°C or 28°C to 50°C).

AC VOLTAGE (TRUE RMS: From 10% to 100% of range)

Range	Resolution	Accuracy	Overload Protection
400V	0.1V	45Hz~400Hz	1000V
1000V	1V	±(1.5%rdg+3dgt)	AC RMS

***Input Impedance: 10MΩ // less than 100pF Crest factor: <3:1**

PEAK VOLTAGE (1 ms PEAK HOLD)

Range	Resolution	Accuracy	Overload Protection
400V	0.1V	±(1.5%rdg+43dgt)	1000V
1000V	1V		AC RMS

Specified accuracy +/-40 digits for changes > 1ms in duration.
***Input Impedance: 10MΩ**

PEAK CURRENT (1 ms PEAK HOLD)

Range	Resolution	Accuracy
400A	0.1A	±(2%rdg+43dgt)
1000A	1A	±(2%rdg+43dgt)

Specified accuracy +/-40 digits for changes > 1 ms in duration.

RESISTANCE

Range	Resolution	Accuracy	Maximum Test Voltage	Overload Protection
400Ω	0.1Ω		3.3V	600V RMS
1000Ω	1VΩ	±(1%rdg+3dgt)	1.25V	

*In continuity mode, built-in buzzer sounds when resistance is less than 10.0Ω

DC CURRENT

Range	Resolution	Accuracy
400A	0.1A	±(1.5%rdg+3dgt)
1000A	1A	±(2%rdg+5dgt)

AC CURRENT (TRUE RMS: From 10% to 100% of range)

Range	Resolution	Accuracy	
		45Hz-65Hz	65Hz~ 2kHz
400A	0.1A	±(2%rdg+5dgt)	±(3%rdg+5dgt)
1000A	1A	±(2.5%rdg+5dgt)	±(3%rdg+5dgt)

*Crest factor: <3:1

K-TYPE TEMPERATURE MEASUREMENT RANGE

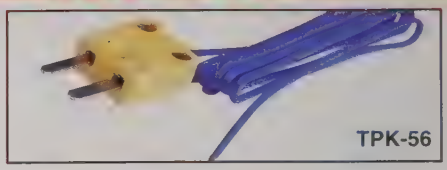
Range	Resolution	Accuracy	Overload Protection
-40°C~ 1372°C	1°C	±(0.5%rdg+3°C)	600 V RMS
-40°F~ 2502°C	1°F	±(0.5%rdg+6°F)	

K-TYPE DIFFERENTIAL TEMPERATURE

The T1 input must be greater than T1 input for T1-T2 measuring.
The accuracy does not include the tolerance of thermocouple probe.

Range	Resolution	Accuracy	Overload Protection
-50°C<ΔT<100°C	1°C	±(0.5%rdg+3°C)	600 V RMS
-58°F<ΔT<180°F	1°F	±(0.5%rdg+6°F)	

MODEL TPK-56, BEAD TYPE-K THERMOCOUPLE (optional)

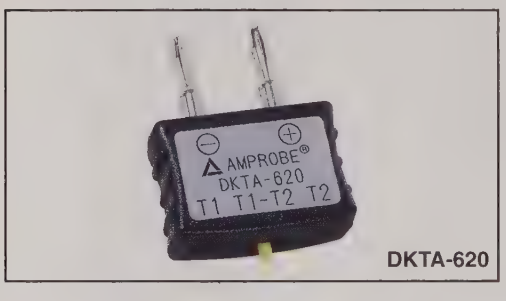

TPK-56

Temperature Rating (wire): 399.2°F (204°C) Continuous
500°F (260°C) Intermittent

Temperature Measuring Range (bead): -50°C to +800°C (MAX).

Accuracy: ±2.2°C or ±0.75% of reading from 0°C to 800°C (whichever is greater)
±2.2°C or ±2% of reading from 0°C to -50°C (whichever is greater)

Caution: The bead end can be touched to surface temperatures above 399.2°F (204°C) for very short durations. However, wire insulation or wire may be damaged if wire is subjected to the same temperature.



DKTA-620

MODEL DKTA-620 DUAL INPUT K-THERMOCOUPLE ADAPTER FOR AC/DC-620T

GENERAL SPECIFICATIONS

Designed and manufactured to conform to UL3111-1, C22.2 NO. 1010.1-92 and EN61010 (IEC1010-1, IEC-1010-2-031, IEC-1010-2-032). Installation Category (Over-voltage Category) II 1000V or Installation Category III 600V, Pollution Degree 2 environment.

Display: Fully annunciated 4-digit liquid crystal display (LCD). Dual display in Temperature mode. 12 segments analog bar graph. Automatic polarity indication.

Measuring Rate: 3.3 times per second (V, A, Ω and Temp) 0.5 ~ 7.6 seconds response time for Capacitance.

Low Battery Indicator: Annunciates when battery voltage drops below 7V (approx.).

Operating Temperature: 0°C to 50°C (32°F to 120°F), 0-80% R.H.

Storage Temperature: -20°C to 60°C (-4°F to 140°F), 0-80% R.H. with BATTERY REMOVED

Temperature Coefficient: 0.12%/°C (from 0°C to 18°C or 28°C to 50°C) or otherwise specified.

Power Supply: Single standard NEDA1604, JIS006P, IEC6F22 carbon zinc or alkaline type 9V battery.

Max. Jaw Opening: To accommodate circuit cables 2" (50.8mm) diameter.

Dimension: 32 (H) x 64 (W) x 260 (L) mm; 1.26" (H) x 2.52" (W) x 10.24" (L)

ACCESSORIES

Description	Amprobe P/N
Safety Test Leads (included)	DTL-3000
Carrying Case (included)	CC-ACDC
9 Volt Alkaline Battery (included)	MN-1604
Instruction Manual (included)	978760
Dual input thermocouple adapter (optional)	DKTA-620
Single input thermocouple adapter (optional)	TAC-DMM
Type K bead probe (optional)	TPK-56

AC/DC-1000A

FEATURES

LCD digital clamp-on for measuring ACV, ACA, DCV, DCA and OHMS, Peak and continuous measuring modes.

- Hooded and fully-insulated jaws
- Accurate
- Auto-ranging
- Measures "Peak" inrush
- Shape and balance permits easy operation in either hand
- Press-to-read button also locks "on"
- Over range and low battery indications
- 9V alkaline battery has long useful life and low replacement cost
- Fused ohmmeter, Circuit protected to 600V
- Extendo-type test leads with replaceable probe tips
- Large, easy-to-read numbers
- Withstands momentary overloads up to 50%
- 10 megohm input impedance on voltage ranges

AC/DC-1000A

SPECIFICATIONS

AC is average-sensing, RMS reading except in Peak mode where it is peak-sensing, RMS reading; DC is average-sensing, average reading.

Frequency Response: AC 40 to 400 Hz; chopped DC 30 to 300 Hz with duty cycle of 20% to 90%.
Update Rate: 2.5 times/sec.
Operating Temperature & Humidity: 32°F to 120°F (0° C to + 49°C) up to 80% relative humidity.
Case Voltage Breakdown: 3000 VAC/DC
Response Time: Peak 0.08 seconds
Fuse: 8AG-360x03, 1 amp fast blow (supplied)
Ohmmeter Test Voltage: 2.5V
Power: 1 No. MN1604, 9V alkaline battery or equal (not supplied)
Battery Life: Based on test cycle of 10 seconds "on" and 20 seconds "off" - 148 hours or 18,000 cycles. Based on test cycle of 20 seconds "on" and one minute "off" - 200 hours or 9,000 cycles.
Size: 9" x 3-3/8" (across jaw) x 1-9/16" (22.9cm x 8.57cm x 3.97cm)

Supplied with Model F2 carrying case, DTL-1A all-weather Extendo test leads, VRC-320 clip adaptor, and OHB-4HE ohmmeter attachment with fuse.

AC Voltage	AC Current Ranges	DC Voltage Ranges	DC Current Ranges	Resistance Range & Accuracy	Accuracy (except ohms) Based on Sinusoidal Waveform	Operating Frequency	Extendo Leads Standard	Display	Zero Adjust	Jaw Size	Weight
Ranges 0-199.9/ 0-199.9/ 600C 1-600P	0-199.9/ 999C 1-999P	0-199.9/ 600C 600P*	0-199.9/ 999C 1-999P*	0-199.9/ 1999Ω ±1%rdg ±1LSD	±1% of reading ±5LSD 0-999 Amps DC 600VAC, 0-750 Amps AC ±1% of reading ±1LSD 0-600 VDC ±3.5% of reading ±5LSD 750-999 Amps AC	AC 40-400Hz, Chopped DC: 30 to 300 Hz	Yes	7/16" LCD	Automatic Except ohms and DC amps	2" 5.08cm	13.2oz. 374.2g

C = Continuous P = Peak LSD = Least Significant Digit
Accuracies based on sinusoidal waveform for AC and continuous DC

*Continuous, chopped, half-wave or full-wave.

Extendo Type Test Leads with Replaceable Probe Tips

ACCESSORIES

All-weather voltage leads	DTL-1A
Ohmmeter attachment	OHB-4HE
Carrying Case	F2
Alligator clip adaptor for DTL-1A	VRC-320
Replacement probe tip for DTL-1A	VPT
Fuse, 1 amp fast blow	8AG-360x023
Battery 9V alkaline	MN1604
Energizer (increases sensitivity by 10 times AC or DC)	A-47L
Amptran 50:1 (5000A) transformer (AC only)	CT50-1
Amptran 50:1 (3000A) transformer (AC only)	CT50-2
Instruction Book	P/N 920755

ACD-2000A & ACD-2001A

FEATURES

Clamp-ons with Multi-sensing™ (Patented) allow the user to select TRMS, Average or Peak sensing.

ACD-2000A

- Multi-sensing™ feature allows the user to select the appropriate test mode:
  True RMS: For accurate measurement of loads with distorted waveforms.
  Average: For use on linear, undistorted loads.
  Peak: To monitor motor in-rush.
  Make comparative evaluations of systems on which they suspect the presence of **harmonic distortion.** This type of analysis is a vital function for accurate measurement on electrical systems that serve computers or other non-linear loads.
- 4000 count display
- Non-decaying Peak hold for continuous monitoring for Peaks of .08 seconds or more.
- Ohmmeter fuse protection to 600 Volts to protect the instrument and the user from damage.
- Autoranging
- Low battery and Peak indication
- Measure waveforms with harmonics to 2KHz.
- Auto Zero Adjust.

PATENTED MULTI-SENSING™ FEATURE

SPECIFICATIONS

Operating Frequency: 40-400 Hz
Sampling Rate: 2.5 times/sec.
Ohmmeter Test Voltage (Full-scale): 200 mV
Ohmmeter Open-Circuit Voltage: 2.5 volts max
Accuracy: Volts and Amps: 2% of reading±2LSD**, 40-400 HZ For true RMS (AC-coupled) mode, the above spec applies for waveforms with crest factor of 3:1 max. Average and peak-hold modes are specified for sine waves only.
In peak-hold mode: the measured surge must last at least 0.08 sec. Peak-hold readings are non-decaying.
**Least significant digit(s)
Ohms: 2% of reading ±2LSD
Battery Life: 65 hours, continuous operation.
Resolution: 0.1 (Volt, Amp, Ohm) on low range, 1 (Volt, Amp, Ohm) on high range.
Case Voltage Breakdown Test: 3000 Volts AC.
Operating Temperature and Humidity: 32°F to 120°F, 0°C to 49°C. Up to 80% RH, non-condensing.
Digit size: 0.4".
Power: One No. MN1604, 9V alkaline battery (not supplied).
Display: A custom 3 3/4 digit liquid crystal display has been designed into model ACD-2000A/2001A for ease of reading and reliability. This display includes annunciators for "low battery" and "peak hold."
Circuit Protection: Fused protected to 600 volts on the Ohms range.
Operating Temperature/Relative Humidity: 32°F(0°C) to 120°F(49°C) 80%RH
Size: ACD-2000A: 8-15/16" x 2-5/8" x 1-19/32" (21.1 cm x 6.7cm x 4.1 cm)
ACD-2001A: 7-1/2" x 2-5/8" x 1-9/32" (19.1 cm x 6.7 cm x 4.1 cm)
Supplied with: 1 No. 8AG-360x023, 1AMP/600V fast blow fuse; one set voltage test leads, (DTL-2 for ACD2000A & DTL-3 for ACD2001A) one OHB-4HE Ohmmeter attachment, one case, instructions.

Multi-mode measuring system - Patent No. 5, 144, 226. Other U.S. & foreign patents pending

ACD-2001A

Model	AC Voltage Ranges	AC Current Ranges	Resistance Range & Accuracy	Accuracy Based on Sinusoidal Waveform	Sampling Rate	Jaw Size	Weight
ACD-2000A	0.1-399.9/999	0.1-399.9/999	0.1-399.9/3999Ω 2%±2 LSD	2%±2LSDVolts/Amps	2.5 Times/Sec.	2" 5.08cm	15oz. 425 g
ACD-2001A	0.1-399.9/999	0.1-399.9/300	0.1-399.9/3999Ω 2%±2 LSD	2%±2LSDVolts/Amps	2.5 Times/Sec.	1" 2.54cm	11oz. 312g

Test Master Kits: One of the ACD digital clamp-ons combined with "Energizer", model A-47L, in a deluxe carrying case, Model ADM, gives you a professional test kit with extra testing capability.
Model TACD-2001A: Includes ACD-2001A, A-47L, DTL-3 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case.
Model TACD-2000A: Includes ACD-2000A, A-47L, DTL-2 leads, VRC-320 alligator clip, OHB-4HE Ohms probe, and ADM deluxe case

ACCESSORIES AND REPLACEMENTS

Standard carrying case for ACD-2000/A	AE
Standard carrying case for ACD-2001/A	AE-2
Deluxe carrying case	ADM
Extendo leads with replaceable probe tips: ACD-2000/A, Included	DTL-2
Extendo leads with replaceable probe tips: ACD-2001/A	DTL-3
Fused ohmmeter test lead	OHB-4HE
Alligator clip adapter for DTL-2 & DTL-3	VRC-320
Fuse, 1 amp fast blow, 600 volt	8AG-360X023
Battery, 9V alkaline	MN-1604
AMPTRAN* flexible link 50:1 transformer (6000A AC)	CT50-1
AMPTRAN* flexible link 50:1 transformer (3000A AC)	CT50-2
Energizer, increases sensitivity by 10 times	A-47L
Replacement probe tips for DTL-2 & DTL-3	VPT
Instruction Book	P/N 79001900

AC/DC-3000

FEATURES

- Backlit fully annunciated LCD display
- Resolution of display is adjustable: 3-3/4 or 4-1/2 digit, 4,000/20,000 counts
- 1mS Peak Hold, (Max and Min recorded) Capture Spikes, Glitches, Motor run and start currents (AC or DC)
- Frequency and Duty Cycle
- AC+DC True RMS current measurement to 1000 Amps
- AC+DC True RMS voltage measurement to 600 Volts
- Resistance measurements, 0.1 Ohm resolution, 40 Meg Ohm Max
- Dynamic Recording, Max, Avg. or Min (100mS response) (Auto Power Off is Disabled for unlimited recording)
- Relative Zero Mode, subtracts a stored value from the present measurement and displays the result
- Data Hold
- 43 Segment High Speed Analog Bar graph
- Audible Continuity Test
- Diode Test
- Auto and Manual Ranging
- Dual Display, View Current/Frequency, Current/Duty Cycle, Voltage/Frequency, Voltage/Duty Cycle
- Auto Power Off & Sleep Mode
- Overload protection on all functions
- Handguard design
- Designed to comply with CE, ULc, TUV, IEC1010 CAT III-600v

Supplied with Amprobe P/N's, DTL-3000 Test Leads, CC-AC/DC Carrying Case, 9 Volt Alkaline Battery, 978750 Instruction Manual.

AC/DC-3000

SPECIFICATIONS

Display: 4-1/2 digits liquid crystal display (LCD) with maximum reading of 4,000/20,000 counts selectable. Backlit, 43 segment analog bar graph with complete annunciators for low battery, automatic polarity indication, max, min, avg, @Off, •))), DC, AC etc.

Functions: DCV, ACV, DCA, ACA, DC+AC V or A, Ohms, Diode Check, Audible Continuity, Frequency and Duty Cycle test.

Measuring Rate: 3.3 times per second in 4000 count mode. 1 time per second in 20,000 count mode. 0.5-2 times per second for Frequency/Duty Cycle tests.

Low Battery Indicator: The [-+] appears when the battery voltage drops below 7 VDC approximately.

Operating Temperature: 0°C to 50°C, 32°F to 120°F, 0-80% RH

Storage Temperature: -20°C to 60°C, -4°F to 140°F, 0-80% RH with battery removed.

Temperature Coefficient: 0.12% /°C (from 0°C to 18°C or 28°C to 50°C)

Power Supply: Single standard NEDA1604, JIS006P, IEC6F22 carbon zinc or 9-Volt alkaline type.

Max. Jaw Opening: To accommodate Conductors 2" (50.8mm) in diameter

Dimensions: 32(H) x 64(W) x 260 (L)mm, 1.26" (H) x 2.52" (W) x 10.24" (L)

Weight: 840 grams with battery included, 1.85 lbs.

Accessories: Included, 1 pair of DTL-3000 test leads, CC-AC/DC Carrying Case, MN-1604 9-Volt alkaline Battery, Instruction Manual 978750.

Safety: Designed to comply with IEC 1010-1 Instrument Category (Overvoltage Category) III, 600V, Pollution Degree 2, CE, ULc, TUV

ELECTRICAL SPECIFICATIONS

Accuracy is given as ±(% of reading + no. of LSD's) at 23°C± 5°C, with relative humidity less than 80% R.H.
In the 4-1/2 digit mode, multiply the number of least significant digits (dgt) by 10.

DC VOLTAGE

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
4V	1mV	±(0.5%rdg+3%dgt)	1200V DC or 850V AC rms
40V	10mV		
400V	100mV		
1000V	1V	±(0.8%rdg+3%dgt)	

Input Impedance: 10MΩ

cont'd on next page...

AC VOLTAGE (True RMS: From 10% to 100% of range)

RANGE	RESOLUTION	ACCURACY (@40-400Hz)	ACCURACY (@400-2kHz)	OVERLOAD PROTECTION
4V	1mV	±(1.5%rdg +5dgt)	±(3%rdg +5dgt)	1200V DC or 850V AC rms
40V	10mV			
400V	100mV			
750V	1V			

Input Impedance: 10MΩ // less than 100pF
Crest Factor: >3:1

AC+DC VOLTAGE (True RMS: From 10% to 100% of range)

RANGE	RESOLUTION	ACCURACY (@40-400Hz)	ACCURACY (@400-2kHz)	OVERLOAD PROTECTION
4V	1mV	±(2.5%rdg +9dgt)	±(3.5%rdg +9dgt)	1200V DC or 850V AC rms
40V	10mV			
400V	100mV			
750V	1V			

Input Impedance: 10MΩ // less than 100pF
Crest Factor: >3:1

PEAK VOLTAGE (1 ms PEAK HOLD)

Specified accuracy ± 40 digits for changes >1 ms in duration

RANGE	RESOLUTION	ACCURACY	OVERLOAD PROTECTION
4V	1mV	±(1.5%rdg+43dgt)	1200V DC or 850V AC rms
40V	10mV		
400V	100mV		
1000V	1V		

Input Impedance: 10MΩ

DC CURRENT

RANGE	RESOLUTION	ACCURACY
40A	0.01A	±(2%rdg+30dgt)
400A	0.1A	±(1.5%rdg+3dgt)
1000A	1A	±(2%rdg+5dgt)

AC CURRENT (TRUE RMS: From 10% to 100% of range)

RANGE	RESOLUTION	ACCURACY (@40Hz-65Hz)	ACCURACY (@65Hz-2KHz)
40A	0.01A	±(2%rdg+10dgt)	±(3%rdg+10dgt)
400A	0.1A	±(2%rdg+5dgt)	±(3%rdg+5dgt)
1000A	1A	±(2.5%rdg+5dgt)	±(3%rdg+5dgt)

Crest Factor: >3:1

AC+DC CURRENT (TRUE RMS: From 10% to 100% of range)

RANGE	RESOLUTION	ACCURACY (@40Hz-65Hz)	ACCURACY (@65Hz-2KHz)
40A	0.01A	±(4%rdg+40dgt)	±(5%rdg+40dgt)
400A	0.1A	±(3.5%rdg+9dgt)	±(4.5%rdg+9dgt)
1000A	1A	±(4.5%rdg+9dgt)	±(5%rdg+9dgt)

Crest Factor: >3:1

AC/DC-3000 (cont'd)

PEAK CURRENT (1 ms PEAK HOLD)

Specified accuracy +/- 40 digits for changes >1 ms in duration

RANGE	RESOLUTION	ACCURACY
40A	0.01A	±(2%rdg+70dgt)
400A	0.1A	±(2%rdg+43dgt)
1000A	1A	±(2%rdg+43dgt)

RESISTANCE

RANGE	RESOLUTION	ACCURACY	MAX. TEST VOLTAGE	OVERLOAD PROTECTION
400Ω	0.1Ω	±(1% rdg+3dgt)	3.3V	600V DC/AC rms
4kΩ	1Ω			
40kΩ	10Ω		1.28V	
400kΩ	100Ω			
4MΩ	1kΩ			
40MΩ	10kΩ	±(3%rdg+5dgt)		

Instant Continuity: Built in buzzer sounds when resistance is less than 10.0Ω

FREQUENCY (AC coupling)

RANGE	RESOLUTION	ACCURACY	MINIMUM INPUT FREQUENCY
200HZ	0.01Hz	±(0.2%rdg+4dgt)	10Hz
2kHz	0.1Hz		
20kHz	10Hz		
200kHz	100Hz		

Overload protection: 1200V DC/ 850Vrms AC; <1,000,000 VxHz

FREQUENCY COUNTER SENSITIVITY		
INPUT RANGE	MINIMUM SENSITIVITY (RMS SINEWAVE)	
(Maximum input for specified accuracy = 10 x Range or 1000V	40 Hz-2 kHz	10 Hz-200 kHz
40A	3A	3A(to 2kHz)
400A	30A	30A(to 2kHz)
1000A	300A	300A(to 2kHz)
4V	0.3V	0.7V
40V	3V	7V
400V	30V	70V (≤140 kHz)
1000V	300V	700V (≤140 kHz)

DUTY CYCLE 0.0 to 99.9%

Accuracy: Within ± (0.3% per kHz + 0.3%) of full scale for a 5V square wave input on the 4V dc range.

DIODE CHECK

RANGE	RESOLUTION	ACCURACY	TEST CURRENT	TEST VOLTAGE
→|←	1mV	±(1.0%rdg+2dgt)	approx. 1.65mA	<3.3V

Overload protection: 600V DC/rms AC

AUDIBLE CONTINUITY TEST

RANGE	RESOLUTION	ACCURACY	TEST CURRENT	TEST VOLTAGE
→|← •)))	1mV	built-in buzzer sounds when reading is below approx. 100mv	approx. 1.65mA	<3.3V

Overload protection: 600V DC/rms AC

DLC-100

FEATURES

DLC-100

The DLC-100 is a multi-functional clamp for Amperage, Voltage, and Resistance measurement. The DLC-100 is sensitive enough to measure very small AC (leakage) currents, typically in the milliamp range. Leakage current in 50/60Hz distribution systems can be an early warning sign or an immediate indication of a dangerous electrical problem, such as conductor insulation breakdown in conduit, motors, compressors, or in any equipment on that circuit. Leakage current measurements are made quickly while the circuit is energized so it is an ideal instrument for testing existing building circuits where power cannot be removed. When leakage current measurements are incorporated into preventative maintenance schedules, acceptable and un-acceptable levels of leakage current can be established to help predict and avoid catastrophic electrical failure and costly downtime. Other features include:

- 5 AC Current Ranges (0-40mA, 400mA, 4A, 40A, 100A)
- 10µA Resolution
- AC Voltmeter to 400VAC
- Resistance Range to 400Ω
- Large, Fully Annunciated, 3-3/4 Digit, 4000 Count LCD
- Audible Continuity Test
- Resistance Range Overvoltage Protected to 600VAC (1 min.)
- Max/Min Function
- Full Scale Overload Alarm
- Data Hold
- Bar Graph Display
- Zero (Null) Button

AC MILLIAMPS, AC VOLTAGE, AND RESISTANCE

SPECIFICATIONS

AC Current:

Though meter can display up to 400A, calibration is not guaranteed.

		Accuracy	
Range	Resolution	50/60Hz	Wide(40-1kHz)
0-40mA	10µA	+/-1.0% rdg. +/-3 dig.	+/-1.5% rdg. +/-5 dig.
0-400mA	100µA	+/-1.0% rdg. +/-3 dig.	+/-1.5% rdg. +/-5 dig.
0-4A	1mA	+/-1.0% rdg. +/-3 dig.	+/-1.5% rdg. +/-5 dig.
0-40A	10mA	+/-1.0% rdg. +/-3 dig.	+/-1.5% rdg. +/-5 dig.
0-80A	100mA	+/-2.5%rdg. +/-10 dig.	+/-2.5% rdg. +/-10 dig.
80-100A	100mA	+/-9.0-% rdg. +/-10 dig.	+/-9.5% rdg. +/-10 dig.

AC Voltage (10MΩ input impedance:

		Accuracy		Overload
Range	Resolution	50/60Hz	Wide(40-1kHz)	Protection
0-400	0.1V	+/-1.0% rdg. +/-3 dig.	+/-2.0% rdg. +/-dig.	800VAC

Resistance (.4V open voltage):

Range	Resolution	Accuracy	Continuity Threshold	O.L. Protection
0-400	0.1V	+/-1.0% rdg. +/-3 dig.	Beep <38 ohms	600VAC (1 min.)

Power Consumption:	10mA (approx.)
Measurement:	Average Sensing
Sampling Rate:	2 times/sec. (display) 20 times/sec. (bargraph)
Operating Temperature:	13°F to 122°F (-10°C to 50°C)
Operating Humidity:	less than 85% relative
Storage Temperature:	-4°F to 140°F (-20°C to 60°C)
Storage Humidity:	Less than 75% relative
Dimensions:	8.3" (L) x 2.4" (W) x 1.4" (H) 210mm x 62.0mm x 35.6mm
Jaw Size:	1.18" (30mm)
Weight:	7.14 oz. (200g) including batteries

INCLUDED ACCESSORIES

Batteries:	Two "AA" 1.5V alkaline (Amprobe model S912, included)
Test Lead Set:	Model DTL-10 (included)
Soft Vinyl case:	Model SV-100 (included)
Instruction Manual:	part number 932762 (included)

FLAT SCALE, ROTARY SCALE,

and JUNIOR CLAMP-ONS

NALOG CLAMP-ONS	AC Volts (VAC)				AC Amps (ACA)															
	to 300	to 600	to 750	to 1000	to 25	to 50	to 100	to 250	to 300	to 600	to 1000	50Hz	60Hz	40-400Hz	Resistance	Pointer Lock	Temperature	Testmaster Kits	Page Number
S-3		X							X			X	X		X	X	X		29
S-3C		X							X			X	X		X	X	X		29
S-3CL		X							X			X	X		X	X	X		29
S-3L		X							X			X	X		X	X	X		29
S-1		X					X						X			X			27
S1-50		X					X					X				X			27
S-1A		X					X						X			X			27
S-1B		X					X						X		X	X			27
S-1B 50		X					X					X			X	X			27
S-1BA		X					X						X		X	X			27
S-1BA50		X					X					X			X	X			27
S-1000		X									X		X		X	X			27
S-1000-50		X									X	X			X	X			27
S-1000E		X									X	X			X	X			27
RS-1000S		X									X		X		X	X			27
RS-1000S 50		X									X	X			X	X			27
RS-1007			X								X		X		X	X			27
S-1007 50			X								X	X			X	X			27
S-1007S			X								X		X		X	X			27
S-1007S 50			X								X	X			X	X			27
S-2	X						X						X			X			27
S-2A	X						X						X			X			27
S-3		X							X				X		X	X		X	27
S-3 Super		X							X					X	X	X		X	27
S-3 400Hz		X							X					X	X	X			27
S-3 50		X							X			X			X	X			27
S-3A		X							X				X		X	X		X	27
S-3A Super		X							X					X	X	X		X	27
S-3A 50		X							X			X			X	X			27
S-300		X							X				X			X			27
S-300 50		X							X			X				X			27
S-300A		X							X				X			X			27
S-5		X							X				X			X			27
S-5A		X							X				X			X			27
S-7		X						X					X		X	X			27
S-7 50		X						X				X			X	X			27
S-7A		X						X					X		X	X			27
S-7A 50		X						X				X			X	X			27
Y25	X				X								X						26
Y500		X					X						X						26
Y550		X				X							X		X			X	26
O-500		X					X						X		X			X	26
O525		X			X								X		X			X	26
O550		X				X							X		X			X	26

YT-25/100, ALP-501

USA

YT-25/100

FEATURES - JUNIOR CLAMP-ON

- Tapered jaws fit into tight spaces. Clamp-around conductors up to 1/2" (1.27cm) diameter or 83.7 MCM
- Range switch keeps instrument on highest range until pressed. Helps prevent instrument overloads.

SIZE: 2-1/4" x 4-3/4" x 1" (6.35cm x 12.07cm x 2.54cm) Weight: 6.5 oz (184g) Supplied with VL-55R test leads and OHJ-R ohmmeter attachment where applicable. Use "AAA" battery (not supplied).

SPECIFICATIONS

Model	AC Voltage Ranges	AC Current Ranges	Resistance Accuracy (25Ω Midscale)	Accuracy (except ohms) Based on Sinusoidal Waveform	Operating Frequency	Other Freq. Calib. Available	Extendo Leads Standard	Display	Zero Adjust	Jaw Size	Weight
Y0500	0-150/600	0-100	+3% of Arc	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz 18
Y0525	0-150/600	0-25	±3% of Arc	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz. 18
Y0550	0-150/600	0-50	±3% of Arc	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz 18
YTO525/100	0-150/600	0-25/100	±3% of Arc	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz. 18
Y25	0-125/250	0-25	–	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz. 18
Y500	0-150/600	0-100	–	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz. 18
Y550	0-150/600	0-50	–	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz. 18
YT525/100	0-150/600	0-25/100	–	±3% Full Scale	60Hz	50Hz only	No	Flat scale	Manual	1/2" 1.27cm	6.5 oz. 18

Test Master Kits

Test Master Kits also available for:
TMY0500 includes YO500 instrument.
TMY0525 includes YO525 instrument.
TMY0550 includes YO550 instrument.

ALP-501 Line Probe 5-In-1 Circuit Tester

FEATURES

The Line-Probe is a five-in-one, pocket-sized tester. Great for trouble-shooting, installations and preventive maintenance. Traces and positively identifies up to 10 separate pairs of conductors at the same time using coded station markers.

Operating Frequency: 60Hz (50Hz calibration available)
Ranges: 0-100 amps, 0-150/600 volts, 1K ohms mid-scale.

Supplied with Model W carrying case, test leads Model VL-55R, ohmmeter battery attachment OHJ-R, station marker Nos. LPM-1 thru 10, two marker holders Model THR and grounding leads Model LGLR.

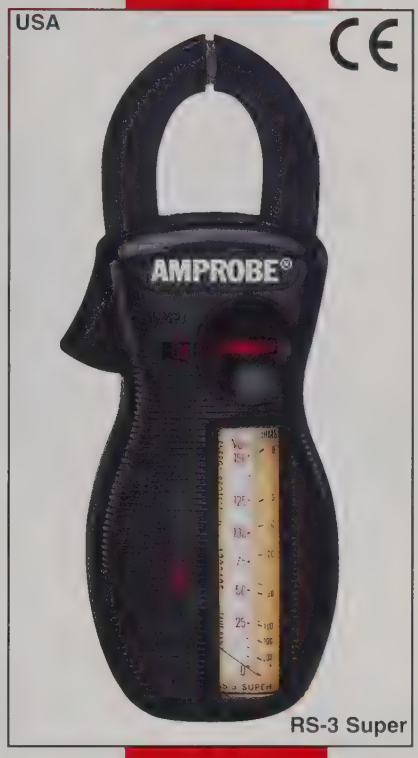
ACCESSORIES AND REPLACEMENTS

Test Master Case for Juniors	K
Line-Probe Case	W
Pouch for Juniors	P-1
Soft Vinyl Zippered pouch	SV
Ohmmeter attachment for Juniors with ohmmeters	OHJ-R
Battery for ohmmeter attachment (AAA)	912
Fuse for ohmmeter attachment 1 amp fast blow	8AG361
Test leads for ALP, Y, YO, YTO Juniors	VL55RI
Replacement tips for VL55R	PT
Extendo Lead set for ALP, Y, YO, YT, YTO	VLK455R
Replacement tips for VLK455R leads (pkg. of 4)	VPT
Alligator clip adapter for use on VPT probe tips	VRC-320
Energizer (increases sensitivity by 10 times)	A-47L
Station Markers (line probe replacement part)	LPM-1 thru 10
Marker Holder	THR
Grounding Leads	LGLR
Instruction Book	P/N 980751

RS-3 Super

FEATURES

- Drop Proof to 5 Feet.
- Operates on Frequencies of 50 through 400Hz.
- Taut Band Movement.
- Model RS-3 (not shown) and RS-3 SUPER has fuse protection on the ohmmeter range against misapplication to 600 volts.
- Extendo Leads act as an extra pair of hands, making voltage measurements faster and easier. They are supplied with all "RS-A" models and have replaceable screw-in probe tips.
- Clamp-on transformer jaws. Take current readings without interrupting service. Clamp around conductors up to 1" (2-54cm) in diameter or 500MCM. 2" (5.08cm) or 2000MCM for 1000 ampere models.
- Pointer lock. Take readings in hard to reach or darkened areas, lock the pointer, and read where it's convenient.
- Recessed break-resistant window magnifies scale, makes reading easier.
- Leads lock in. Can't unexpectedly pull out and leave high voltage exposed.
- All RS model instruments are supplied with all-weather test leads, carrying case and ohmmeter battery adapter where applicable.
- Models RS-7 and RS-7A have a volt/amp output jack for connecting an accessory recording module, model PRS-7R, not supplied
- Models RS-1000S and RS-1007S have built-in, manually-set surge indicating capability. Measure motor starting currents and voltage increases lasting 1/6 second or longer.
- "A" Models include deluxe "AR" carrying case, Extendo Leads and VRC-320 Alligator Clip Adapter
- High case breakdown voltage: 3500VAC
- Instruction book-P/N 915740



RS-3 Super

SPECIFICATIONS

Model	AC Voltage Ranges	AC Current Ranges	Resistance* Accuracy	Case	Operating Freq.	Jaw Size	Weight
RS-1	0-150/600	0-6/15/40/100	N/A	SV-RS	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-1A	0-150/600	0-6/15/40/100	N/A	AR	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-1B	0-150/600	0-6/15/40/100	25Ω midscale ± 3% arc	SV-RS	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-1BA	0-150/600	0-6/15/40/100	25Ω midscale ± 3% arc	AR	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-2	0-150/300	0-6/15/40/100	N/A	SV-RS	60Hz	1" (2.54cm)	10 oz. (283 g)
RS-2A	0-150/300	0-6/15/40/100	N/A	AR	60Hz	1" (2.54cm)	10 oz. (283 g)
RS-3	0-150/300/600	0-6/15/40/100/300	25Ω midscale ± 3% arc	SV-RS	60Hz	1" (2.54cm)	10 oz. (283 g)
RS-3A	0-150/300/600	0-6/15/40/100/300	25Ω midscale † 3% arc	AR	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-3 SUPER	0-150/300/600	0-6/15/40/100/300	25Ω midscale ± 3% arc	SV-RS	50 - 400Hz	1" (2.54cm)	10 oz. (283 g)
RS-3A SUPER	0-150/300/600	0-6/15/40/100/300	25Ω midscale ± 3% arc	AR	50 - 400 Hz	1" (2.54cm)	10 oz. (283 g)
RS-300	0-150/300/600	0-6/15/40/100/300	N/A	SV-RS	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-300A	0-150/300/600	0-6/15/40/100/300	N/A	AR	60HZ†	1" (2.54cm)	10 oz. (283 g)
RS-5	0-300/600	0-10/40/100/300	N/A	SV-RS	50Hz	1" (2.54cm)	10 oz. (283 g)
RS-5A	0-300/600	0-10/40/100/300	N/A	AR	50Hz	1" (2.54cm)	10 oz. (283 g)
RS-7	0-150/300/600	0-5/25/50/100/250	25Ω midscale ± 3% arc	SV-RS	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-7A	0-150/300/600	0-5/25/50/100/250	25Ω midscale ± 3% arc	AR	60Hz†	1" (2.54cm)	10 oz. (283 g)
RS-1000	0-150/300/600	0-15/40/100/300/1000	25Ω midscale ± 3% arc	E	60Hz†	2" (5.08cm)	12 oz. (340 g)
RS-1000S	0-150/300/600	0-15/40/100/300/1000	25Ω midscale ± 3% arc	E	60Hz†	2" (5.08cm)	12 oz (340 g)
RS-1007	0-150/300/750	0-15/40/100/300/1000	25Ω midscale ± 3% arc	E	60Hz†	2" (5.08cm)	12 oz. (340 g)
RS-1007S	0-150/300/750	0-15/40/100/300/1000	25Ω midscale ± 3% arc	E	60Hz†	2" (5.08cm)	12 oz. (340 g)

* All the above listed models have a 25-ohm midscale ohmmeter. Integral fuse/battery attachment OHB-3HE supplied with fuse. Use "AAA" battery, not supplied

† Alternate frequency calibration available.

NOTES:
- RS Models are "average" sensing instruments calibrated to read out in RMS.
- Accuracy (except ohms) based on sinusoidal waveform is ± 3% Full Scale.
- Display is rotary/analog and zero adjust is manual.
- Model RS-3 SUPER is calibrated to operate on frequencies of 50 through 400 Hz operation for the maritime and aircraft industries.

TM-43A & TM-63A Super

FEATURES

USA

TM-43A SUPER

TM-43A Super Testmaster Kit

Contains RS-3-SUPER instrument; VLK411R Extendo Leads; deluxe "C" case; A-47L Energizer; VRC-320 alligator clip adapter; OHB-3HE ohmmeter battery attachment; PSA-1 Phase Sequence Adapter which helps determine phase sequence of 3-phase circuits. A50-1 Deca-Tran® which expands current measuring capability by 10 times up to 1200 amps intermittent duty, 600 amps continuous; and ADP-45 adapter.

Above kit also available without PSA-1 Phase Sequence Adapter. Order model TM-33A-SUPER

TM-63A Super Testmaster Kit

Contains RS-3-SUPER instrument, VLK-411R Extendo Leads for faster, easier voltage testing; Deluxe "AR" case provides easy access to instrument and quick inventory of accessories A-47L Energizer for current readings as low as 0-0.6 amps and effectively "splits" 2-conductor line cords; VRC-320 alligator clip adapter, OHB-3HE ohmmeter battery attachment and ADP-45 adapter.

Above kit also available without RS-3-SUPER instrument. Order model TM-60.

Accessory Recording Modules For Use With Models RS-7 and 7A

It measures. It records. A whole new idea in measuring and recording instrumentation. Model RS-7 is a rotary scale clamp-on that measures amps, volts and ohms. It has all the famous features of AMPROBE RS instruments plus a recorder output jack for connecting it to a companion recording module. Model PRS-7R or PRS-7RT available separately as an accessory. The model RS-7 or RS-7A combined with a PRS-7R or on ammeter to start... with the option of "adding on" chart recording capability when you are ready. The PRS-7RT offers you the flexibility of buying a recording volt/ammeter package at one time or just a clamp-on ammeter to start. . . with the option of "adding on" chart recording capability when you are ready.

The PRS-7R (-1or -12) or PRS-7RT recording module is designed to record the voltage or current measurement of the RS-7.

Model RS-7A with deluxe carrying case and Extendo Leads is also available. *Model PRS-7RT is a take-up reel recording module with built-in variable chart speeds of 1", 12" and 24" per hour. RS-7 / 7A Ranges: 0-5/25 / 50 / 100 / 250 AC Amps; 0-150 / 300 / 600VAC; 25 ohms mid-scale ohmmeter.

Accuracy; PRS-7R, PRS-7RT, when used with RS-7 or RS-7A ± 4% of Full Scale. Accuracy is based on sinusoidal waveform.

PRS-7R uses strip chart No. 850A for current and 830AV600 for voltage. (Not supplied, order separately.)

PRS-7RT can use strip chart 850A (30 ft. long) or 850A-6 (60 ft. long) for current and 830AV600 (30 ft. long) or 830AV600-6 (60 ft. long) for voltage (not supplied).

USA

TM-63A SUPER

ACCESSORIES AND REPLACEMENTS

Deluxe case for RSA models (except 1000 amp models)	AR
Standard case for RS models (except 1000 amp models)	SV-RS
Soft vinyl zippered pouch (except 1000 amp models)	SV
Case for 1000 amp model;s	E
Attache-type case for TM-33A, TM-43A	C
Ohmmeter attachment for RS-3 and RS-3 SUPER	OHB-3HE
Battery for ohmmeter attachment (AAA)	912
Fuse for OHB-3HE attachment 1 amp 600V	8AG-360X023
Test leads for RS models	VL11S
Extendo Lead set for 100, 250 or 300 amp RS models	VLK-411R
Extendo Wide Temperature Range Test Leads (-40°F to 120°F)	VLK-411R-WTR
Extendo Lead set for 1000 amp RS models	VLK-100R
Replacement tips for VLK-411R and VLK-100R Leads (pkg. of 4)	VPT
Alligator clip adapter for use on VPT probe tips	VRC-320
Deca-Tran®10 to 1 transformer (600A)	A50-1
Energizer (increases current sensitivity by 10 times (for plug-in devices)	A-47L
Amptran® flexible ling 50 to 1 transformer (6000A)	CT-50-1
Amptran® flexible link 50 to 1 transformer (3000A)	CT-50-2
750 volt multiplier lead	VL750R
Adapter to convert male plug to alligator clip	ADP-45
Phase sequence adapter	PSA-1
Meter lead assembly for RS-7 to PRS-7R	MTL-7R
Ground adaptor for A474 energizer	ADP-46
Instruction Book	P/N 932758

FS-3, VT-124

FEATURES - FS-3

- Drop proof to 5 feet
- Ohmmeter fused to 250VAC
- Check surface, air or liquid temperatures with optional probes
- Taut band meter movement
- Average sensing, RMS Calibrated
- Pointer lock

4 Models To Choose From

Power: One S915 "AA" battery (not supplied)
Fuse: One 8AG-361.5 0.5 amp, 250 volts fast blow (supplied)
Model FS-3: Fahrenheit scale instrument with test leads
Model FS-3C: Celsius scale instrument with test leads
Model FS-3L: Fahrenheit scale instrument with test leads and carrying case
Model FS-3CL: Celsius scale instrument with test leads and carrying case
Size: 7-3/4" x 2-3/4" x 7/8" (19.69cm x 6.99cm x 2.22cm)

SPECIFICATIONS

Model	AC Voltage Ranges	AC Current Ranges	Resistance Ranges & Accuracy	Temp. Range	Accuracy (Except Ohms) Based on Sinusoidal Waveforms	Operating Frequency	Display	Zero Adjust	Jaw Size	Weight
FS-3	0-150/300/600	0-6/15/40/100/300	Rx1 (25Ω midscale) Rx100 (2500 midscale ±3% of arc)	-25° to +225° F (optional probe)	±3% Full scale	50/60 Hz	Flat scale	Manual	1" 2.54 cm	12 oz 340.1g

Model FS3C same as FS3 except temperature range is: -32° to 107°C

ACCESSORIES AND REPLACEMENTS

Fuse, .5 amps, 250 volts, fast blow	8AG-361.5
Battery, AA (requires 1)	S915
Immersion temperature probe	RBT-11P*
Universal temperature probe	RBT-12P*
Vented air temperature probe	RBT-13P*†
Extendo "Wide Temperature Range" test leads (-40°F -120°F))	VLK-411R-WTR
Carrying Case	L
Test Leads	VL-11S
Instruction Book	P/N 956750
Replacement tip for VL-11S	VPT

* Not to be used in corrosive applications. †not to be used above 150°F

FEATURES - VOLTPROBES®

- Neon lamps light up "thermometer style" indicating voltage level. "B" models have a buzzer which sounds when voltages as low as 12 volts are applied
- Neon lamp design does not affect most SCR circuits
- Test button distinguishes readings from those due to distributed capacitance or high resistance leakage
- Receptacle check chart on back of tester lets you check out 120VAC grounded convenience outlets
- Safe operation: No additional resistors or fuses are required
- Coiled lead cord extends to 50 inches

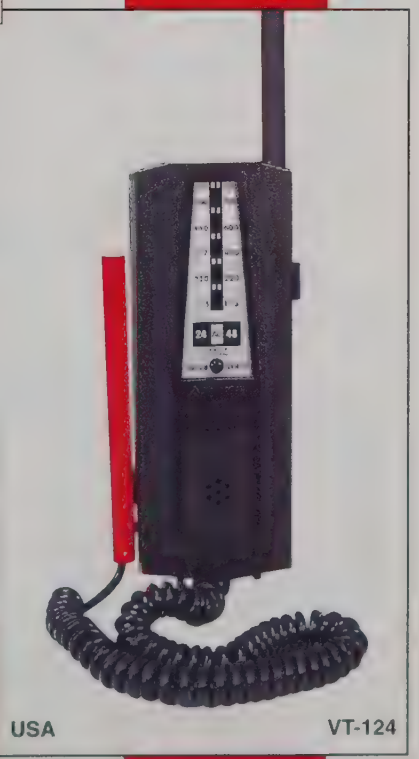
Model VT100, VT100B Ranges: 115/220/277/440/550/VAC
115/220/400/600/750VDC

Model VT124, VT124B Ranges: 24/48/115/220/277/440/550VAC
115/220/400/600/750VDC

Frequency Range: 25 to 800 Hz

Weight: 5 oz. (142 grams)

Size: 6-1/16" x 2-1/2" x 15/16"
15.4cm x 6.4cm x 2.4cm



ACCESSORIES AND REPLACEMENTS

Carrying Case for VT100/100B/124/124B	VC
Receptacle Check Chart (pkg. of 2)	LVT
Replacement Probe Tips (pkg. of 4)	VPT
Soft Vinyl Zippered Pouch	SV
Instruction Book	P/N 945754

CLAMP-ON ACCESSORIES

FEATURES

Deca-Tran® 10 to 1 Transformer

Model A50-1 can be used with any AMPROBE clamp-on AC ammeter (including certain recorders and multimeters)* to extend current ranges by 10 times up to 1200 amps intermittent duty (20 seconds maximum), 600 amp continuous duty. Instrument clamps around pick-up coil at end of line cord, which is 2 feet long for remote readings. Accommodates cable up to 2" (5.08cm) in diameter or 2000 MCM, and bus bar 3/4" x 2 1/2" (3.63cm x 6.35cm).Supplied with model D carrying case. Insulated for use on circuits up to 3000 volts, 4200 volts peak.

Accuracy is ±3%. Weight: 8 oz. (226.8g)

INSTRUCTION BOOK: P/N 916751

NOTE: Cannot be used with models LAW78, ACD-1, ACD-3, ACD-3A ACD-9, ACD-9A, ACD-2000A, A664-4B, A703, A753 or PAA-1500

FEATURES

Amptran® 50 to 1 Transformers

Flexible-link, clamp-on current transformers extend current ranges of AMPROBE clamp-on ammeters by 50 times up to 6000 amperes intermittent duty (15 minutes maximum), or 5000 amperes continuous duty. Quick release button permits Amptran to be opened for easy clamping around conductor without shutting down service. Flexible link construction of Model CT50-1 adjusts in shape to accommodate bus measuring up to 3 15/16" x 8-7/8" (10.00cm x 22.54cm) or cable 7-1/2" (19.05cm) in diameter. Model CT50-2 adjusts to accommodate bus measuring 3-7/8" x 3-7/8" (9.84cm x 9/84cm) or cable 3-7/8" (9.84 cm) in diameter.

Eight foot cord (2.4m) permits position of instrument where it will be least affected by extraneous magnetic fields. Adjustable centering bars permit position of conductor in center of transformer window.

Pick-up coil will accommodate jaws of AMPROBE rotary scale clamp-ons, digital clamp-ons current transducers for AMPROBE multimeters, and all AMPROBE current recorders except Model P/FAA1500. Can be used with AW-80 or AW-81 and AM-4B or LAW-82 for current measurements. Cannot be used with DC clamp-ons to measure DC current. Insulated for use on circuits up to 5000 volts (7000 volts peak).

CT50-1 supplied with centering bars, non-conductive wing nuts and model CTC-1 carrying case. CT50-2 supplied with model CTC2 Carrying case.

NOTE: CT50-1 & 2 cannot be used with ACD-10, ACD-12, or DLC-100

Model	Max. AC Current	Accuracy
CT50-1 (six link)	6000 intermittent 5000 continuous	±2% to 5000 amps ±3% 5000 to 6000 amps
CT50-2 (four link)	3600 intermittent 3000 continuous	±2% to 3000 amps ±3% 3000 to 3600 amps

CLAMP-ON ACCESSORIES

FEATURES

Energizer Model A-47L

Increase the current measuring sensitivity of AMPROBE clamp-on ammeters, recorders (except PAA1500 and LAW78), and multimeters by 10 times for more precise current readings on small appliances and fractional horsepower motors. Effectively "splits" two-conductor line cord for readings at outlets under load. Permits voltage measurement at outlet under actual conditions. Adaptor model ADP-45 permits series connection of energizer for two current readings on permanently wired equipment. Optional ground adaptor model ADP-46 enable energizer to maintain existing equipment ground while taking current measurement on 120 VAC/15 amp equipment.

INSTRUCTION BOOK - P/N 919758

Capacity: 15 amps, continuous duty; 16 to 20 amps, one minute.

NOTE: Also available with screw-in European round prongs, 2 extra British-type prongs and British fuse plug adaptor. Specify model A-47-CL.

Model A47-L and A47-CL supplied with model T carrying case. Weight: 4 oz. (113.4g)

USA

Energizer Model A-47L
"Splits" double conductor line cords. Multiplies current measuring sensitivity by 10x.

A-47L

FEATURES

PSA-1 Phase Sequence Adaptor

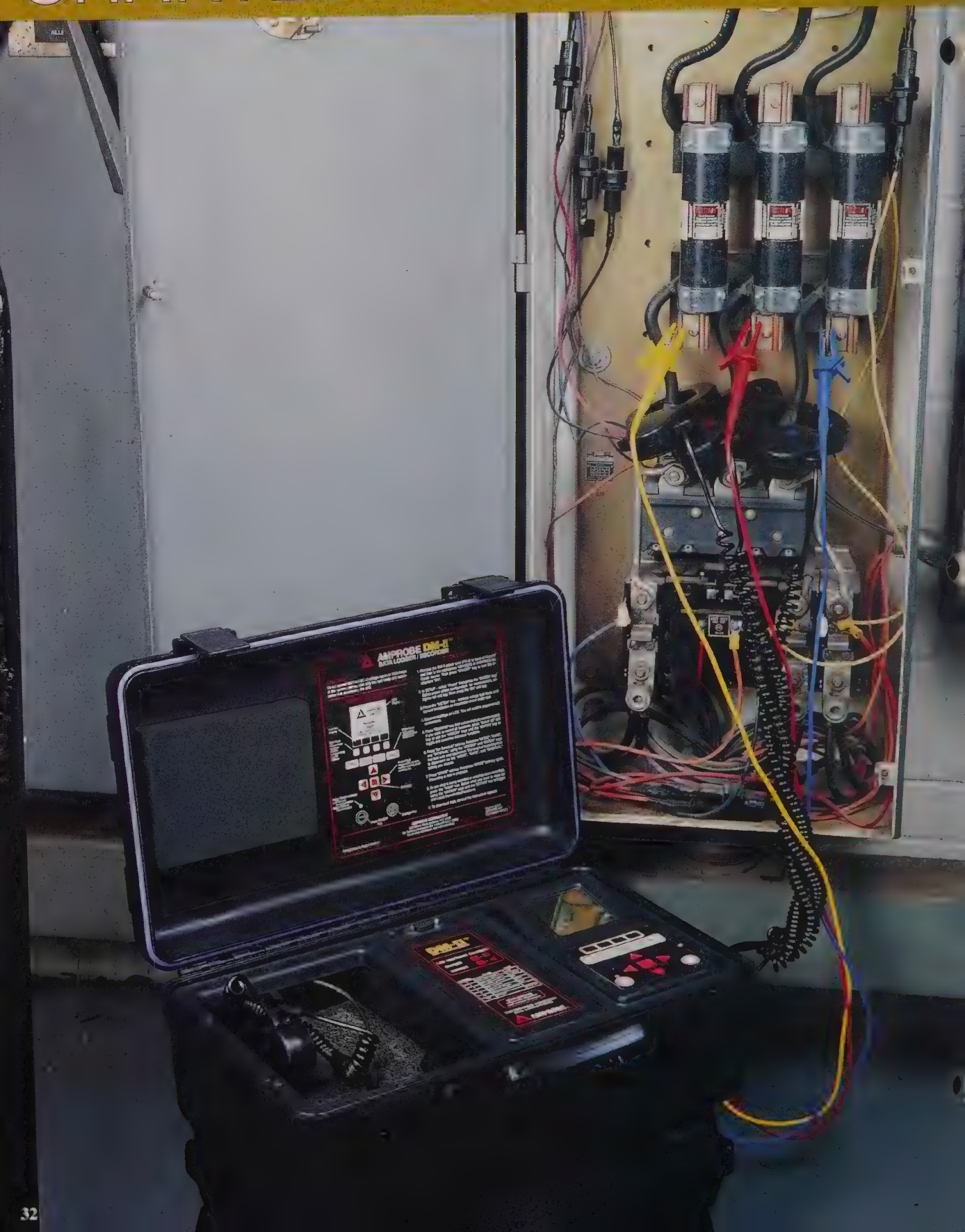
Determines phase sequence of 3-phase electrical circuits up to 550VAC, 25-60Hz. Use with any AMPROBE clamp-on or multimeter or other meter with appropriate voltage range. Supplied with model R carrying case.

INSTRUCTION BOOK: P/N 921750

USA

PSA-1

CHARTLESS RECORDERS



CHARTLESS RECORDERS

DATA LOGGERS/RECORDERS		MODEL	
FEATURES	**RANGE**	DM-I	DM-II
AC Volts	600 V		X
	750 V	X	
Min. Volts		X	X
Max Volts		X	X
Avg. Volts		X	X
Peak Max Volts	130 µ Sec		X
AC Amps	1000 A	X	X
Min. Amps		X	X
Max. Amps		X	X
Avg. Amps		X	X
Peak Max Amps	80 m Sec.	X	
Peak Max Amps	130 µ Sec.		X
Power Measurements	P (watts)		X
	S (VA)		X
	Q (VAR)		X
	ṫPF		X
Energy	Kilowatt Hours (KWH)		X
	Peak Demand (KW)		X
Frequency Response Hz	50/60	X	X
Memory	600k Ram		X
System Configuration	1Ø	X	X
	3Ø	X	X
True RMS		X	X
Real Time Clock			X
LCD Display			X
LED Display		X	
PC Interface/	Windows™ 3.11, 95 and NT		X
Data Download Capable			X
UL			X
CE			X
Multi Languages			X
Catalog Page Number		34	35

DM-I™ DATA LOGGER/RECORDER

USA

DM-I™

FEATURES

The AMPROBE DigiMatic™ model DM-I is a portable 3-phase micro-computer-based chartless recorder. It incorporates 4 LED digits which recall and display more than 41 days of data from 44 separate functions: present reading, peak, "Relative" time of peak, minimum reading, "Relative" time of minimum, maximum reading, "Relative" time of maximum, average reading, sweep of present readings, power failure, and total time. The DM-I™ does not have the capability to interface with a PC or download data.

"PEAK" indicates the highest current surge (80 msec. min) measured. "MAX" indicates the largest average maximum voltage or current measured over 6 second intervals.

- True RMS sensing
- Built-in circuit will retain memory in case of power loss.
- "Confidence Test" - at start of any recording run, all segments of all LED digits and all LED lamps will be illuminated for a few seconds.
- Start switch has a safety feature which prevents loss of previously recorded data.
- Monitors 9 readings sequentially in "record" mode "sweep" position.
- Continuously monitors one of six variables at the turn of a switch in "present reading" mode.
- Measures and records data from 6 different inputs in the "record" mode.

SPECIFICATIONS

Ranges:	0-750 volts AC, auto-ranging 0-1000 amps AC, auto-ranging
Resolution:	0.1 (0-100.0) 1.0 (100-999.9)
Accuracy:	Volts ±1.0% of Rdg ±2 LSD Amps ±1.5% of Rdg ±2 LSD Peak ±2.0% of Rdg ±5 LSD
	Based on measurement frequency between 40-400 Hz.
Response Time:	6 sec. maximum in record mode 2 sec. in present reading mode 80 msec. in peak mode
Power:	Switch selection of 120V/60Hz or 240/50 Hz Battery back-up to retain memory in the event of power failure, requires 4 "C" type zinc carbon or alkaline batteries.
Battery life:	Fresh carbon cell batteries will last 96 hours; fresh alkaline batteries will last 144 hours.
Recording Time:	999.9 hours
Operating Temperature:	32° to 120°F (0° to 49°C), up to 85% RH
Sensing:	True RMS on current and voltage functions Peak sensing on peak current functions
Case Breakdown:	2500 volts
Overvoltage Protection:	100% or 1500 volts
Digit Size:	7/16" (1.1 cm)
Size:	13 1/2" L x 5 1/2" H x 10"W (34.3cm x 14cm x 25.4cm)
Weight:	7 1/2" (3.4Kg)

ACCESSORIES AND REPLACEMENTS

0.2 amp Slo-Blo fuse	3AG-313
Voltage leads (set of 4)	DVL-1
1.5V Alkaline Battery (pkg of 2)	MN1400
Instruction Book	P/N 923751

DM-II™

FEATURES

The New DigiMatic™ II is an AC Data Logger/Recorder in a stand alone configuration. Data can be viewed in the field via its large self-contained backlit LCD Display or can be accessed and downloaded to a personal computer.

- Three DM-II™ versions: DM-II™ Stnadard Unit; DM-II™ CE CE Approved; DM-II™ NA UL Approved
- Single or three phase capable
- AC voltage 5 to 600 volts
- AC current 1 to 1000 amperes
- 3 Channels for voltage measurements and 4 channels for current measurements
- Graphic display 160x160 pixel
- All readings are True RMS
- Power Measurements include: 1- Watts, 2- Vars, 3- VA, 4- PF(Power Factor)
- Energy Measurements include: 1- KW-HR's, 2-Demand or Non Demand
- User selectable recording rates.
- DM-II View™ software allows downloading data to a personal computer running Windows™ 3.11/95 and NT environment. Computer requirements: 486 - 50Mhz, 8Megs of RAM (16Meg recommended).
- Line Operated (120V/60Hz & 240V/50Hz)
- Battery backup protects memory if a power failure occurs and allows recording session to continue.
- Auto Ranging
- Real time clock
- Multi Languages built in: 1- English, 2- German, 3- Spanish, 4- Italian, 5- French
- Rugged ABS plastic case with a weather resistant design
- Made in USA

SPECIFICATIONS

Inputs: Voltage - Three voltage channels with common (V1, V2, V3 and COM). The test leads are flexible straight sheath banana plugs on each end, rated 1000Vrms and a length of 6 feet (set of four supplied). The alligator clips have a 1 inch jaw opening and are rated at 10A max (set of four supplied).

Current - Four current channels (I1, I2, I3, I4)
DM-CT: 1 to 1000A ±1% of reading (four supplied)
ACF3000: 30A to 300A ±1% of full scale
300A to 3000A ±1% of full scale

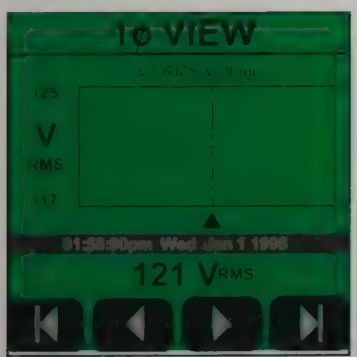
Note: The ACF-3000 is an optional accessory. A total of three would be required for a 3Ø measurement. Adaptor ACF-5 is required.

Ranges: AC Voltage measurements (True RMS) 5 to 600 Vrms.
AC Current measurements (True RMS) 1 to 1000 Arms with four supplied DM-CT's

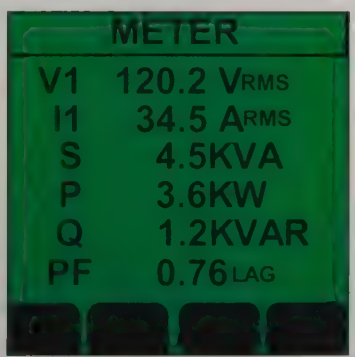
Accuracy: Voltage measurements ± 1% of reading +3 LSD's
Current measurements ± 1% of reading +3 LSD's

Voltage and Current Measurement Selections: True RMS voltage and current, RMS max, RMS min, RMS avg, Peak max

DMII™ TYPICAL LCD SCREENS

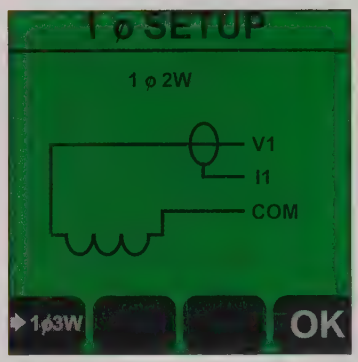


VIEW MODE

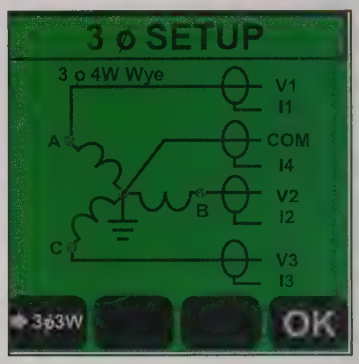


METER MODE

DMII™ TYPICAL LCD SCREENS (cont'd.,)



1 Ø 2 WIRE SET-UP MODE



3 Ø 4 WIRE Y SET-UP MODE

Power measurement Capabilities: Real Power P (watts), Apparent Volt-amperes S (VA), Reactive Volt amperes Q (VAR), True Power Factor (tPF)

Energy Measurement Capabilities: Kilowatt Hours (KWH), Demand (KW)

Programmable Thresholds: User selectable high/low limits for RMS voltage and current.

Recording Modes/Rates/Intervals: User selectable normal and loop (wrap around) recording modes. User selectable recording rates of 1 sec, 5 sec, 15 sec, 30 sec, 1 min, 5 min, 15 min, 30 min. Recording intervals for Demand (KW) are 15 min and 30 min.

Memory: Total of 600K RAM memory. The recording session length depends on the recording rate, the number of selections, recording mode, and recording interval. The memory has a lithium battery backup to preserve its contents in the event of the absence of AC power and batteries.

Real Time Clock: The user programmable real-time clock is displayed in 12/24 hour formats and HH:MM:SS Day month year, daylight savings option, accuracy ±1 min per month.

System Configuration: Total of four presorted setup configurations for 1Ø and 3Ø systems: 1Ø 2W, 1Ø 3W, 3Ø 3W Straight Delta, and 3Ø 4W Wye.

Note: Any or all parameters of a phase configuration can be recorded.

PC Interface: Optically isolated RS-232 serial interface. DM-II View™ software for display, analysis, and report generation. User selectable baud rates of 9600, 19200 and 38400 baud.

Power Requirements: AC line voltage with battery backup operation. The ON/OFF dual color LED indicates the unit's power source - Green indicates AC line power and Red for battery backup power.

Designed to Meet: UL3111-1, CE (LVD/EMC/EMI)

Sample Rate: 130µ sec. (7.68 KHz, 128 samples per cycle per channel, total of 8 channels).

Case: Material: Injection molded flame retardant ABS911, rugged, water-resistant, and corrosion proof.
Case dimensions: 17.5" x 11.6" x 7.5"
Weight: 16 lbs. (7.3 kgs.) includes batteries, 4 CTs, voltage leads and alligator clips.
Pressure relief valve: Important - Be sure the knob located next to the handle is open when encountering atmospheric changes.

Battery: 6 alkaline "D" cells (not supplied)

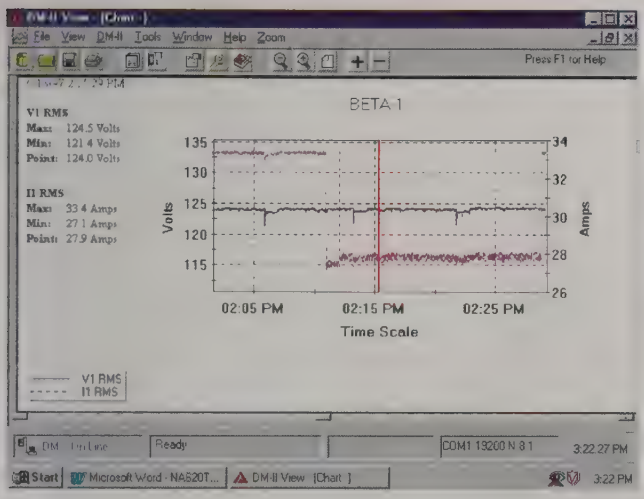
Battery Life: 21 hours continuous with backlight OFF, 1 sec. recording rate, normal recording mode, all parameters selected for 3Ø 4W WYE configuration

Operation Temperature Range: 32 to 122°F (0-50°C) RH<85%

Storage Temperature Range: -4 to 140 °F (-2 to 60°C) RH<90%

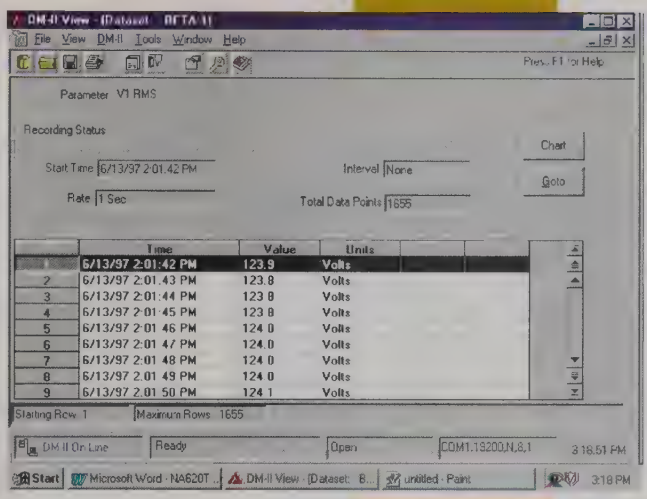
DMII™ (cont'd.)

DMII VIEW™ TYPICAL SCREENS



GRAPHIC DISPLAY OF ENTIRE LOGGED (RECORDED) DATA POINTS (READINGS).

NOTE: SINGLE PHASE VOLTAGE & SINGLE PHASE CURRENT



DATA SET (LOG) SCREEN ALLOWS VIEWING OF ALL LOGGED (RECORDED) DATA POINTS (READINGS).

NOTE: 9 OF 1655 DATA POINTS ARE VISIBLE ON THE SCREEN.

SYSTEM REQUIREMENTS FOR DM-II VIEW™ USER INTERFACE

Windows™ 3.11/Windows™ 95 and Windows™ NT compatible

486-50DX or higher

8MB RAM minimum, 16MB recommended

Hard disk requires 4.5MB for installation

Full memory download of 600KB requires 9.6MB on hard drive

Graphic Display: User adjustable contrast, LED backlight, 160x160 pixel, STN
Switch Keypad: 15 key membrane switch keypad, shielding protection, embedded dual color red/green LED indicating power from line voltage or from batteries.

ACCESSORIES & REPLACEMENTS

Test Leads & Alligator Clips (Set of 4)*	DVL-2
Current Transducer (Black)*	DM-CT-BK
Current Transducer (Red)*	DM-CT-R
Current Transducer (Blue)*	DM-CT-B
Current Transducer (Yellow)*	DM-CT-Y
Output Lead*	RS-232
Power Cord*	PC-4
DM-II View™ 3.5" Discs (Set of 5)*	DISC-II
DM-II™ Instruction Manual	PIN 995754
Flexible Current Transducer (3000 Amps)**	ACF-3000
Adapter for Flexible Current Transducer (BNC male to 2 Pin twist connector)**	ACF-5

*Supplied
**Optional

LAV21 RMS/LAV3 RMS/LAA3RMS

USA

LAV-21RMS

USA

LAV-3 RMS

FEATURES

AMPROBE has combined the rugged reliability of our mechanical time-sharing recorders with True RMS Accuracy. These units will provide many years of dependable data recording in virtually any electrical application.

Time-sharing is an economical way to record multiple variables on one chart. During normal operation the recorder will read and print the instantaneous value of the first variable before going on to the next variable. The end result is a recording of all variables sequentially. Each variable is printed as a different number of dots to differentiate one trace from another. The imprint rate is dictated by the chart speed selected:

@1"/hr. the imprint rate is once every 60 sec.
@6"/hr. the imprint rate is once every 10 sec.
@12"/hr. the imprint rate is once every 5 sec.

The LAA3RMS is a 3-phase current recorder.
The LAV3RMS is a 3-phase voltage recorder.
The LAV21RMS records one voltage input and one current input.

Each recorder is supplied with a power cord and a roll of chart paper, as well as all necessary accessories; the LAA has three specially calibrated current transducers; the LAV has three sets of meter cords and clip leads; the LAV21 has one current transducer and one set of cords and clip leads.

All models are also available in the Take-up configuration– add suffix '-T' to the model number (ex.: LAA3RMS-T).

SPECIFICATIONS

MODEL	RANGES	USE CHART*
LAA3RMS† (T)	0-15/60/150/300 AC Amps	300SVA (-6)
LAV3RMS† (T)	0-150/300/600 AC Volts	830AV600 (-6)
LAV21RMS (T)	0-150/300/600 AC Volts	300SVA (-6)
(1Phase Only)	0-15/60/150/300 AC Amps	300SVA (-6)

*30 foot chart supplied. -6 suffix denotes 60 foot chart for take-up.

† Will record 1,2, or 3 phases

Accuracy: ±3% of Full Scale from 50-70Hz
±5% of Full Scale from 70 - 400 Hz
Crest Factor: 3:1 Maximum
Power Requirements: 120 Volts 60 Hz 3 Watts
Operating Temperature: 32°F (0° C) to 122°F (50°C)

ACCESSORIES AND REPLACEMENTS

Power Cord	PC-3
Meter input cord (Black) LAV-21 RMS (T)	VL-71B
Meter input cord (Red)	VL-72R
Meter input cord (Green)	VL-73R
Power cord (Gray), 2 conductor (for older recorders)	PL-70
Alligator adaptor cord (Black)	RAL-4
Alligator adaptor cord (Red)	RAL-4R
Alligator adaptor cord (Green)	RAL-4G
Instruction Book (LAV 3RMS)	P/N 991750
Instruction Book (LAA 3RMS)	P/N 991754
Instruction Book (LAV 21RMS)	P/N 991751

LAS-800

FEATURES

- Solid state circuit design
- Easy to use, affordable
- All 3 disturbances appear on the same chart
- Low battery indication
- Response time to 350 nano Seconds
- User adjustable thresholds for all 3 variables

Power line disturbances can cause modern electronic equipment, such as computers, to malfunction. Common types of power line disturbances are high frequency impulses (spikes), voltage dips (sags), and voltage increases (surges). Even though monitoring for these disturbances can be costly and time-consuming, it is important to monitor the line to determine if protection is necessary, and if so, the type.

The AMPROBE LAS-800 strip chart recorder offers an easy to use, affordable solution to monitoring. Through the use of advanced solid state circuit design, the LAS-800 can monitor the power line for all three types of disturbances and display the results on a strip chart. The AMPROBE LAS-800 can easily be moved from site to site because of its rugged design and small size.

USA

LAS-800

SPECIFICATIONS

Ranges: 0-220/440/880 volts, full scale, 50 or 60 Hz
Nominal voltage ranges are average responding, calibrated in terms of RMS
Spike-Sag-Surge voltage ranges are peak sensing, but scaled in terms of RMS

Accuracy: Nominal voltage ranges ±3% Full Scale Sag & Surge modes, ±3% Full Scale, ±2% of reading based on sinusoidal waveforms.
NOTE: sag & surge response time is 1/2 cycle of 50 or 60 Hz sinewaves
Spike mode, ±3% Full Scale, ±10% of reading.
Spike accuracy is specified for a rectangular pulse whose rise time is greater than 35 nanoseconds and whose sum of rise time plus peak duration is at least 350 nanoseconds. Accuracy diminishes for narrower spikes.

Input Impedance: 220 volt range - 387 Kohms (±1%)/15pf)
440 volt range - 784K ohms (±1%)/15pf)
880 volt range - 1580K ohms (±1%)/15pf)

Threshold Adjustment Range: Surge & Spike are adjustable from 0% to 100% of full Scale. Sag is adjustable from 0% to 50% of Full Scale.

Battery Backup(for memory only): Two 9V alkaline batteries Model MN1604

Line Power: 120VAC, 60 Hz, 9 Watts (50 Hz Available)

Operating Temperature Range: 32°F to 122°F (0°C to 50°C)

Chart Speed: 12"/Hour

Line Fuse: 0.2 amp, 250V Model 3AG-313

Input Overload: 50% Full Scale for 1 minute

Size: 7 1/2" x 5 1/4" x 9 1/4" (19.05cm x 13.34cm x 23.50 cm)

Weight: 5 Lbs. (2.27Kg)

Supplied with one red and one black test lead, one line power cord and one 30 foot roll of model 800S chart paper.

Not available with take-up reel capability, nor with one inch per hour chart speed.

ACCESSORIES AND REPLACEMENTS

9V alkaline battery	MN1604
0.2 amp 250 volt fuse	3AG-313
Strip Chart (30 feet)	800S
Power Cord	PC-3
Safety Voltage Test Leads	VL-74
Instruction Book	P/N 911750

LAW-78 KWH/LAW-79 KWH

FEATURES

The LAW78KWH and LAW79KWH are the first low cost recording Watt/VAR meters designed to record both power consumption and reactive volt/amperes in all of the most common single-phase and three-phase (three and four wire) systems (balanced or unbalanced). In addition this is not only a recorder but a **PORTABLE KILOWATT HOUR METER** with an 8 digit LCD display (kw mode only). They may also be used to record only kilowatts or kilovars (Leading or Lagging).

Each recorder comes complete with four color-coded voltage leads, three color-coded clamp-on current transducers, and a power cord.

All switches (including Lead/Lag switch for capacitive or inductive loads) are located on an easy to use control panel. Selected range is indicated by LED(s) providing positive identification of range being used. Select from combinations of 3 current ranges LAW78KWH 0-200/400/800 (LAW79KWH 0-50/100/200); and 7 voltage levels (120/208/220/240/277/480/550 VAC).

When used as a time-sharing recorder, one complete recording sequence with the LAW78KWH or LAW79KWH (8 consecutive dots for watts, 2 consecutive dots for vars) takes 50 seconds at 12"hr. and 10 minutes at 1"/hr. With the LAW78-KWH-T or LAW79KWH-T, one complete recording sequence (8 consecutive dots for watts, 2 consecutive dots for vars) takes 25 seconds at 12"/hr and 2.5 minutes at 2"/hr.

USA LAW-78 KWH

SPECIFICATIONS

Accuracy: Based on sinusoidal waveforms and power factors above 50%: Watts ±3% F.S. Vars ±4% F. S. **Kilowatt-hour readout:** Better than 2% of reading +/– 1 count.
Based on sinusoidal waveform with a power factor ≥0.5% ambient temprature = 77°F (25°C)
Energizer A47L may be used with the LAW79 KWH on 120 VAC systems to add three additional ranges of 0-.75/1.5/3.0 kilowatts, based on 15 amps continuous rating of A47L.
CT50-1 & 2 may be used to increase current inputs 50 times to 5,000/3,000 amperes respectively.
May add up to ±3% of reading when PF is over 80%, up to ±4% when PF is below 80%.
Lead Length: All leads are 5 feet long. They may be extended to 100 feet by splicing in #18 copper wire.
Operating Temp: 32°F to 113°F (0°C 45°C)
Kilowatt-Hour Read-out Battery Life: 5 years
Power: 120V 60Hz
Fuse Rating: .25 amps./250V
Weight: 7 lbs. (3.17 kg)

MODEL	KW/KVARS RANGES	USE CHART
LAW78 KWH-12	0-30/60/120/240/960	896W
LAW78 KWH-1	0-30/60/120/240/960	896W
LAW78 KWHT-12*	0-30/60/120/240/960	896W 896W-6
LAW78 KWHT-2*	0-30/60/120/240/960	896W 896W-6
LAW79 KWH-12	0-7.5/15/30/60/120/240	824W
LAW79 KWH-1	0-7.5/15/30/60/120/240	824W
LAW79 KWHT-12*	0-7.5/15/30/60/120/240	824W 824W-6
LAW79 KWHT-2*	0-7.5/15/30/60/120/240	824W 824W-6

* 30 foot chart supplied. -6 is 60 foot chart for take-up models only.

Table of Ranges

			KW/KVAR RANGES					
	AMPERES		LAW78KWH(T)			LAW79KWH(T)		
VOLTS	LAW78KWH(T)	LAW79KWH(T)	x1/4	x1/2	x1	x1/4	x1/2	x1
120-1Ø	0-200	0-50	30	60	120	7.5	15	30
120-1Ø	0-400	0-100	60	120	240	15	30	60
120-1Ø	0-800	0-200	120	240	480	30	60	120
120/208-3Ø	0-200	0-50	30	60	120	7.5	15	30
120/208-3Ø	0-400	0-100	60	120	240	15	30	60
120/208-3Ø	0-800	0-200	120	240	480	30	60	120
240-1Ø (3-wire)	0-200	0-50	30	60	120	7.5	15	30
240-1Ø (3-wire)	0-400	0-100	60	120	240	15	30	60
240-1Ø (3-wire)	0-800	0-200	120	240	480	30	60	120
240-3Ø	0-200	0-50	30	60	120	7.5	15	30
240-3Ø	0-400	0-100	60	120	240	15	30	60
240-3Ø	0-800	0-200	120	240	480	30	60	120
208/277-1Ø	0-200	0-50	60	120	240	15	30	60
208/277-1Ø	0-400	0-100	120	240	480	30	60	120
208/277-1Ø	0-800	0-200	240	480	960	60	120	240
277/480-3Ø	0-200	0-50	60	120	240	15	30	60
277/480-3Ø	0-400	0-100	120	240	480	30	60	120
277/480-3Ø	0-800	0-200	240	480	960	60	120	240
240-1Ø (2 wire)	0-200	0-50	60	120	240	15	30	60
240-1Ø (2 wire)	0-400	0-100	120	240	480	30	60	120
240-1Ø (2 wire)	0-800	0-200	240	480	960	60	120	240
550-3Ø	0-200	0-50	60	120	240	15	30	60
550-3Ø	0-400	0-100	120	240	480	30	60	120
550-3Ø	0-800	0-200	240	480	960	60	120	240

* Use 277/480V-3ϕ setting for 380V-3ϕ

ACCESSORIES AND REPLACEMENTS

Power Cord	PC-4
Voltage Test Lead (set of 4)	DVL-1
Instruction Book	P/N 961750
.25 amp 250 volt fuse Fast Blow	47-1200-02

PAV/PAVA/PAA

FEATURES

AMPROBE voltage recorders are designed to monitor voltage conditions over a wide variety of ranges. Models PAV2X, PAV3X and PAV4X are expanded scale recorders. Because their scales do not start at zero, they provide a high degree of readability.

One RAL-4 adaptor clip lead (RAL-4E for 220VAC, 50Hz models) is supplied.

The ranges are switched by means of a slide switch located on the input panel. Model PAV4X is only available calibrated for 50Hz and has a 220 VAC 50Hz drive motor.

MODEL†	VOLTAGE RANGES	USE CHART*
PAV2X (-1, -12, -T)	95-130/190-260 AC1Ø	835X3A
PAV3X (-1, -12, -T)	95-130/190-260/380-520 AC 1Ø	835X3A
PAV4X (-1, -12, -T)	165-245/330-490 AC (50Hz only) mode	840X2
PAV8600 (-1, -12, -T)	0-150/300/600 AC 1380Ω/V1Ø	830AV600

*30 foot chart supplied. -6 suffix denotes 60 foot chart for take-up

Instruction Book: P/N 986760

Accuracy: Based on 60Hz sinusoidal waveform
PAV8600, ±3% F.S.
PAV2X, PAV3X, PAV4X ±1.25% F.S.

USA

PAVA-83

Recording Volt/Ammeters

AMPROBE combination volt/ammeters provide the extra flexibility of monitoring either AC voltage or current (not at the same time however). Current is monitored by simply clamping the split-core current transducer around the conductor in which the current is to be measured. No need to interrupt service.

All models, except the PAVA87, have expanded-scale voltmeter ranges. Because these scales do not start at zero, they provide a high degree of readability.

All models are supplied with one power cord, one voltage meter cord, one clamp-on current transducer, one roll of chart paper, and one RAL-4 Adaptor Clip lead (Model RAL-4E for 220 VAC 50Hz models).

Changing voltage ranges is accomplished by means of a switch located the recorder itself. For all models the current range switch is located in the base of the current transducer.

MODEL†	AC RANGES	USE CHART
PAVA81 (-1, -12, -T)	95-130; 190-260 Volts 0-10/50/250/500 Amps	835X3A 850A
PAVA83 (-1, -12, -T)	95-130; 190-260; 380-520 Volts 0-10/50/250/500 Amps	835X3A 850A
PAVA84 (-1, -12, -T)	95-130; 190-260; 380-520 Volts 0-5/25/100/250 Amps	835X3A 850A
PAVA85(-1, -12, -T) 50Hz	165-245; 330-490 Volts 0-10/50/250/500 Amps	840X2 850A
PAVA87(-1, -12, -T)	0-150/300/600 Volts 0-10/50/250/500 Amps	830AV600 850A

Accuracy: Based on 60Hz sinusoidal waveforms. Expanded scale voltmeter ranges ±1.25% F.S. All other voltmeter ranges 3%F.S. Ammeter ranges ±3% F.S. using transducer furnished with recorder; ±5% F.S. if using transducer other than furnished with recorder.

*30 foot chart supplied. -6 suffix denotes 60 foot chart for take-up

Instruction Book: P/N 986755

Recording Ammeters

AMPROBE recording ammeters utilize the split core transformer principle. The clamp-on transducer is simply clamped around the conductor in which the current is to be measured. No need to interrupt service. All models are single phase units.

All models are supplied with one power cord and one clamp-on current transducer.

Changing current ranges is accomplished by means of a switch. On the models PAA81 and PAA82 the switch is located in the base of the current transducer. On the PAA1500 the switch is located on the input panel.

MODEL†	AC CURRENT RANGES	USE CHART*
PAA81 (-1, -12, -T)	0-10/50/250/500 1Ø	850A
PAA82 (-1, -12, -T)	0-5/25/100/250 1Ø	850A
PAA1500 (-1, -12, -T)	0-800 1Ø 0-1500 1Ø	800AA 1500AA

Accuracy: Based on 60Hz sinusoidal waveforms. PAA81 and PAA82 ±3% F.S. using transducer supplied with recorder; ±5% F.S. if using transducer other than supplied. PF1500; ±4% F.S. using transducer supplied with recorder. Other transducers cannot be used without special calibration.

*30 foot chart supplied. -6 suffix denotes 60 foot chart for take-up

Instruction Book: P/N 986757

† NOTE: All recorders on this page are available in three versions: **Take-up**, designated by a **'-T'** suffix or **Non-Take-Up** in either of two factory-set chart speeds designated by a **'-1' for 1"/hr.**, chart speed or **'-12' for 12"/hr.** chart speed.

The Take-Up models have three adjustable chart speeds: 1,12, 24 inches/hr. and will accept a 60 foot roll of chart paper (**-6**' suffix added to chart number).

The imprint rate for the Take-Up models is once every 2.5 seconds. For the Non-Take-Up models, it is once every 60 seconds for the '-1' and once every 5 seconds for the '-12'.

LT8200RFE/P3100/PT8100

FEATURES

USA LT-8200RFE

Models LT8200RFE and LT8200RCE are time-sharing recorders that can record two temperatures (refrigerator/freezer cabinets, indoor/outdoor, duct intake/outlet) and one "on/off" event (on/off operation of compressor, electric heating element, fan or pump motor). They can also be set up to record just one temperature. When set up as a time-sharing recorder, the two temperatures and one event are recorded in a controlled sequence (T1, Ev, T2, Ev, T2, T2) which repeats. This results in one-dot, two dot and three-dot patterns that identify the traces of the three variables on the chart. The LT8200RFE/RCE temperature ranges are determined by the probes that are used with the recorder.

Two probes (not supplied with recorder) with the same temperature span must be used together. The "on/off event" is sensed by an AC clamp-on current transducer supplied with the recorder; currents of 4-300 amperes would appear as full scale indication for "event on." For "event off" or zero amperes, a trace would be printed below the switch zero line. These are not recordings of amperes, they are merely "on/off" indications. Currents of less than 4 amperes can be increased by means of the Energizer A47-L, available separately as an accessory.

Model PT8102 is a single input, triple range °F temperature recorder. Changing range is accomplished by changing the chart and probe (not supplied).

Model PT8100 (°F) single input, is a dual range temperature recorder. Changing range is accomplished by means of a switch located on the input panel and changing the chart. Models P3100 and P3100C are single input very accurate, multi-range pyrometers that can accept any type J iron-constantan thermocouple with a resistance up to 500 ohms. The recorders automatically compensate for the resistance.

All portable models are supplied with a power cord (P/N PC-3). Model PT8100 is supplied with one FL-RBT-3 probe. Temperature probes for the other recorders must be ordered separately. The LT8200RFE and LT8200RCE are supplied with a clamp-on current transducer. All recorders are supplied with two rolls of chart paper, one for each range, as indicated.

Instruction Book: P/N 984759 LT Series

Instruction Book: P/N 984645 P3100 Series

Instruction Book: P/N 985751 PT Series

MODEL	RANGE	USE CHART	USE PROBE	ACCURACY
LT8200RFE* time sharing	-40° to +60°F -3.5° to +118°F +70° to +210°F	4060(-6) 3118 (-6) 70210 (-6)	2-RBT-11 or RBT-12 or RBT-13 2-RBT-14 2-RBT-15	-20° to +40°F; ±2°F Other Points: ±3°F +20° to +100°F: ±2.5°F Other Points: ±3.5°F +90° to +180°F: ±2.8°F Other Points: ±4.2°F
LT8200RCE* time sharing	-40° to +15°C -18° to +48°C	4015C(-6) 1848C(-6)	2-RBT-11 or RBT-12 or RBT-13 2-RBT-14	-29° to +4°C: ±1.1°C Other Points: ±1.7°c -6.7° to +37.8°C; ±1.3°C Other Points: ±2°C
P3100-(T,1, 12)†	+32° to +272°F +212° to +452°F +390° to +830°F +750° to +1190°F	452F(-6) 452F(-6) 1190F (-6) 1190F (-6)	1-TC-6 or order any Type J iron-constantan thermocouple with resistance up to 500Ω	Less thermocouple: +32° to +452°F: ±6.8°F +390° to +1190°F: ±10.8°F
P3100C-(T,1, 12)†	+0° to +120°C +100° to +220°C +200° to +440°C +400° to +640°C	220C(-6) 220C (-6) 640C (-6) 640C (-6)	1-TC-6 or order any Type J iron-constantan thermocouple with resistance up to 500Ω	Less thermocouple: +0° to +220°C: ±3.5°C +200° to +640°C: ±5.9°C
PT8100-(T, 1,12)†	-50° to +100°F +50° to +250°F	823T1(-6) 833T2 (-6)	FL-RBT-3 FL-RBT-3	-50° to +20°F; ±4°F +20° to +100°F: ±3°F +50° to +250°F: ±5°F
PT8102 -(T, 1,12)†	-40° to +60°F -3.5° to +118°F +70° to +210°F	4060(-6) 3118 (-6) 70210 (-6)	1-RBT-11 or RBT-12 or RBT-13 1-RBT-14 1-RBT-15	-20° to +40°F; ±2°F Other Points: ±3°F +20° to +100°F: ±2.5°F Other Points: ±3.5°F +90° to +180°F: ±2.8°F Other Points: ±4.2°F

* Take-up versions are available by adding a **'-T'** after the catalog number. The take-up models can accept a 60 foot roll of chart paper - just add a **'-6'** after the chart paper catalog number. Each of the time-sharing recorders has a variable chart speed of 1"/hr., 6"/hr., or 12"/hr.

† These recorders are available in two additional versions: **Take-up,** designated by a **'-T'** suffix and having three user-adjustable chart speeds of 1"/hr., 12"/hr., or 24"/hr.; **Non-take-up** in either of two factory-set chart speeds designated by a **'-1'** suffix for a 1"/hr. chart speed or **'-12'** suffix for a 12"/hr. chart speed.

PDV8600/PDC850/PDB81

FEATURES

All AMPROBE milli and micro-ammeters are supplied with power cord, a meter lead cord and one 30 foot roll of chart paper.

DC Voltmeter

Records DC voltage only.

MODEL†	VOLTAGE RANGE	USE CHART
PDV8600 (-1, -12, -T)	0-150/300/600 DC 3,333Ω/V	830D

Accuracy: ±3% F.S.

USA PDV-8600

Milli/Microammeter DC Recorders

DC milliampere and microampere recorders are single range, self-contained instruments which measure and record DC current.

MODEL†	RANGE	USE CHART
PDC8500 (-1, -12, -T)	0-500μA300 ohms	850D (50 Div)
PDB81 (-1, -12, -T)	0-1mA 36 ohms	850D (50 Div)

Size: 7 1/2" x 5 1/4" x 9 1/4" (19.05cm x 13.34cm x 23.5cm)
Weight: Milliampere, microampere and millivolt recorders 3½ lbs. (1.59 Kg)
5 amp basic recorders 3 1/4 lbs. (1.47Kg.)
Accuracy: ±2% F.S.
Instruction Book: P/N 987758

Meter Lead Assemblies

FOR MODELS	USE MODEL
PDC & PDB	ALS-1

† These recorders are available in two versions: **Take-up**, designated by a **'-T'** suffix and having three user-adjustable chart speeds of 1"/hr., 12"/hr; or 24"/hr **Non-take-up** in either of two factory-set chart speeds designated by a **'-1'** suffix for a 1"/hr chart speed or **-12'** suffix for a 12"/hr. chart speed. Take-up models can accept a roll of 60' chart paper: add **'-6'** to chart model number.

TEMPERATURE RECORDER ACCESSORIES

PROBE FOR PT8100 AND PT8101, FIG. 5	FLRBT-3
Immersion type probe for LT8200RFE/RCE and PT8102/C (-40°F to +60°F-40°C to +15°C), Fig 6	RBT-11
Immersion probe with"Banana" plug type lead terminations for use with AM-2B, AM-2BB, AM-2BBDP, AM-2E, AM-2EDP, AM-3E, AM-4A, AM-4B, AM-12	RBT-11B
Immersion probe for use with FS-3 (-25°F to +225°F/-32°C to +107°C)	RBT-11P
Universal type probe for LT8200RFE/RCE and PT8102C (-40°F to +60°F/-40°C to +15°C), Fig 6	RBT-12
Universal probe with"Banana" plug type lead terminations for use with AM-2B, AM-2BB, AM-2BBDP, AM-2E, AM-2EDP, AM-3B, AM-3E, AM-4A,AM-4B AM-12	RBT-12B
Universal probe for use with FS-3 (-25°F to +225°F/-32°C to +107°C)Fig. 6	RBT-12P
Vented Air Probe for LT8200RFE/RCE and PT8102C (-40°F to +60°F/-40°C to +15°C) Fig. 6	RBT-13*
Vented Air Probe with "Banana" plug type lead terminations for use with AM-2B, AM-2BB, AM-2BBDP, AM-2E, AM-2EDP, AM-3B, AM-3E, AM-4A, AM-4B, AM-12	RBT-13B*
Vented Air probe for use with FS-3 (-25°F to +225°F/-32°C to +107°C)	RBT-13P*
Probe for LT8200RFE/RCE and PT8102C (-3.5°F to +118°F/-18°C to +48°C), Fig 6	RBT-14
Universal type probe for LT8200RFE and PT8102 (+70°F to +210°F), Fig 6	RBT-15
Extension lead for RBT-11, 12, 13, 14 and 15. Length: 15 ft. (4.57m) maximum of 10 extension leads per probe	RBT-X
Iron-Constantan thermocouple for P3100/C recorders 6 ft long with exposed bead	TC-6

NOTE: Temperature probes intended for non-corrosive applications only.

*Not to be used in temperatures above 150°F.

RECORDER/TEST LEAD ACCESSORIES

RECORDER CURRENT TRANSDUCERS

DESCRIPTION RANGES:	
0-10/50/250/500. Supplied with models PAA81, PAVA81; PAVA83; PAVA87; PAVA85 (50Hz)	**A70FL 60Hz** **A-75FL 50Hz**
RANGES:	
0-5/25/100/250. Supplied withmodels PAA82, PAVA82; PAVA84 and PAVA86 (50Hz)	**A-60FL 60Hz** **A-65FL 50Hz**

NOTE: Output of above current transducers is approximately 265µA DC at full scale. Movement resistance is 400 ohms.

NOTE: Transducers can be used with Deca-Tran® A50-1*, Energizer A-47L and Amptran® CT50-1 and CT50-2 to measure currents as low as 0.0.5 amperes and up to 5,000 amperes. *Except LAW78/79KWH, LAA3RMS and LAV21RMS.

NOTE: Transducers for LAA3E, LAA3RMS, LAV21E, LAV21RMS, and LT8200RFE/RCE not available separately.

Transducer for PAA1500 not available separately. Transducer for LAW78/79KWH not available separately.

NOTE: The lead length of any* of the current transducers for recorders can be lengthened by splicing in up to 750 ft of two conductor 18 gauge copper wire. *Except LAW78/79KWH, LAA3RMS, and LAV21RMS.

DESCRIPTION	
240 volt adaptor allows recorder and power factor meters with 120VAC motors (except time-sharing models) to operate on 240VAC.	**ADV-220**
240 volt adaptor allows LAW78/79KWH, and time-sharing 120VAC motors to operate on 240VAC.	**ADV-221**
High voltage adaptor. Use with LAV3E, PAV8600, PAVA87 recorders with or LAV21E to extend voltage range to 750VAC.	**AV750**
Adaptor converts 2 prong male plug to alligator clips. allows measurement of voltage at panel box and enables recorder to be operated on line voltage (120VAC) available at panel box.	**RAL-4**
Same as above with red insulators	**RAL-4R**
Same as above with green insulators	**RAL-4G**
Adaptor for 220VAC, 50Hz recorders	**RAL-4E**
Same as above with red insulators	**RAL-4ER**
Same as above with green insulators	**RAL-4EG**

ALL PURPOSE MODULAR TEST LEADS AND ACCESSORIES

MODEL	DESCRIPTION	USED WITH MODEL	INTERFACES WITH ACCESSORY MODEL
VLEAD	36" Right Angle to Banana Safety Lead Adapters	AT2001, 2002, 2003, 2004, 2005 ACD-10, 10S, 11, 12, ACDC610, ACD-330T AM-4B, 6B, 12, 14, 15, 16, 17, 18, 90, 91 1200, 1250, 1260, 1280, 50, 52, 53, 55, 56, 57, 59 HA1000, 2000, ACDC-3000, ACDC 620T *AM-1E, 2E, 2EDP, 3E, 6A, 20, 21, 22 *AMB-1A, 2, 4D ***With VBAN**	VBPRO, VLPRO, VCROC, VBAN, VPLNG, and *VALL
VBAN	Insulated to Non-Insulated Banana Adapters	AM-1E, 2E, 2EDP, 3E, 6A, 20, 21, 22 AMB-1A, 2, 4D	VLEAD
VCROC	Crocodile Clip Adapters		VLEAD
VALL	Low Voltage Alligator Clip Adapters		VLEAD with VBAN
VBPRO	Large Test Probe Adapters		VLEAD
VLPRO	Small Test Probe Adapters		VLEAD
VPLNG	Right Angle Plunger Adapters		VLEAD

REPLACEMENT TEST LEADS & ACCESSORIES

Replacement Test Leads and Accessories

INSTRUMENT	STANDARD LEAD SET	PROBE TIP	OPTIONAL LEADS	OPTIONAL LEAD CLIP	OHM PROBE	FUSE	BATTERY	STANDARD CASE	OPTIONAL CASE
ACD-1,3,3A, 9A	DTL-2	VPT		VRC-320	OHB-4HE	8AG-360X023	MN1604(9V)	AE	ADM
ACD-2, 4A, 7A, 8A	DTL-3	VPT		VRC-320	OHB-4HE	8AG-360X023	MN1604(9V)	AE-2	ADM
ACD-4A	DTL-3	VPT		VRC-320					ADM
ACD-10 Series	DTL-12			VRC-320		FUSELESS	MN-1604(9V)	SV-16	
ACD-11	DTL-10		APM******	VRC-320		FUSELESS	MN-1604(9V)	SV-1	
ACD-12	DTL-12		ETL-10	VRC-320			MN-1604(9V)	SV-12	
ACD-330T	DTL-3000		APM******	VRC-320			MN-1604(9V)	CC-AC/DC	
ACDC-610	DTL-10		APM******	VRC-320			MN-1604(9V)	SVPC	
ACDC-620T, 3000	DTL-3000		APM******	VRC-320			MN-1604(9V)	CC-AC/DC	
ACDC-1000A	DTL-1A	VPT		VRC-320	OHB-4HE	8AG-360X023	MN-1604(9V)	F-2	SV-1
ACDC-1000	DTL-2	VPT		VRC-320	OHB-4HE	8AG-360X023	MN-1604(9V)	F-2	SV-1
ACD-2000(A)	DTL-2	VPT		VRC-320	OHB-4HE	8AG-360X023	MN-1604(9V)	AE	ADM
ACD-2001(A)	DTL-3	VPT		VRC-320	OHB-4HE	8AG-360X023	MN-1604(9V)	AE-2	ADM
JUNIORS	VL-55R	PT	VLK-455R	VRC-320	OHJ-R	8AG-361	S912(AAA)		K,W,SV,P-1
AM-1A	MTL-1		APM******	MTC-3		8AG-361	S915(AA)		MM
AM-1E	MTL-2		APM******	MTC-3		8AG-361	S915(AA)		MM
AM-2A,2B	MTL-1		APM******	MTC-3		3AG-312A	S915(AA)		MM
AM-2DP,BDP	MTL-1		APM******	MTC-3		3AG-312	S915(AA)		MM
AM-2E,2EDP	MTL-2		APM******	MTC-3		8AG-361.5	S915(AA)		MM
AM-3E	MTL-2		APM******	MTC-3		8AG-361,3AG-312	Two C's		MM-3
AM-4B	MTL-4B	VPT	APM******	VRC-320		6.3X25-2-12	MN-1604(9V)		ADM
AM-6	MTL-1		APM******	MTC-3		8AG-361-6	S915(AA)		MM-6, SV
AM-6A	MTL-6A		APM******	VRC-320		8AG-361-6	S915(AA)		MM-6, SV
AM-6B	MTL-6B		APM******	VRC-320		5X20-250.5	S915(AA)		
AM-12	MTL-12	VPT	APM******	VRC-320		6.3X25-2-12	MN1604(9V)		MM-12, SV
AM-14	MTL-12	VPT	APM******	VRC-320		6.3X25-2-12	MN1604(9V)		MM-14
AM-15	MTL-15		APM******	VRC-320		6.3X25-2-12	MN1604(9V)		SV-1
AM-16	MTL-18		APM******	VRC-320		6.3X25-10-12	(2)S912 (AAA)		SV-1
AM-17,18	MTL-18		APM******	VRC-320		6.3X25-10-12	MN1604(9V)		SV-1
AM-20,21,22	MTL-20		APM******	VRC-320		6.3X25-2-12	MN1604(9V)		SV
AM-50, 53	MTL-90A		APM******	VRC-320			MN1604(9V)		
AM-55, 56	MTL-90A		APM******	VRC-320		KLK-15	MN1604(9V)		
AM-71, 90, 91	MTL-90A		APM******	VRC-320		FA-6X32/63*	MN1604(9V)		CC-ACDC
AM-90/91	MTL-90		APM******	MTC-3		FA-6X32/.63*	MN1604(9V)		CC-ACDC
AM-1200	MTL-1200		APM******	VRC-320		6.3X25-2-12	MN1604(9V)		SV-1
AM-1250,1260,1280	MTL-1200		APM******	VRC-320		6.3X25-2-12**	MN1604(9V)		SV-1
AMB-1A,2	MTL-6		APM******	MTC-3		8AG-361	(8) S915(AA)		MOB
AMB-4D	MTL-6		APM******	MTC-3			(6) S915(AA)		MOD
AMB-5KV	MTL-5KV						MN-1300		
AMC-2,3,4	MTL-3		APM******						MOC,MOL
AT-1000	C2901 & C2902		APM******				(2)MN1604(9V)		
AT2001	C2901 & C2902		APM******			380.25-6X32	MN1604(9V)		
AT2002	C2901 & C2902		APM******			660.25-6X32	MN1604(9V)		
AT2003	C2902		APM******			2502-6X32	(2) MN1604(9V)		
AT2004,2005	C2901 & C2902		APM******			660.25-6X32****	(2) MN1604(9V)		
DLC-100	DTL-10						MN1604(9V)	SV-100	
FS-3	VL-11S	VPT	VLK-411R***	VRC-320		8AG-361.5	S915(AA)		L
FS-3L	VL-11S	VPT	VLK-411R***	VRC-320		8AG-361.5	S915(AA)	L	SV-1
GP-1	GP-TL		APM******			5X20-250.32	MN1300		GP-BP
HA-1000	MTL-15		APM******				(6) S915(AA)		
HA-2000	HAVL-2		APM******				(6) S915(AA)		
PMM-1	*****	*****	*****	*****			(2)912(AAA)	SV-12	
RS series	VL-11S	VPT	VLK-411R***	VRC-320	OHB-3HE	8AG-360X023	912(AAA)	SV-RS	AR, C
RS-1000 & S	VL-11S	VPT	VLK-100R	VRC-320	OHB-3HE	8AG-360X023	912(AAA)	E	

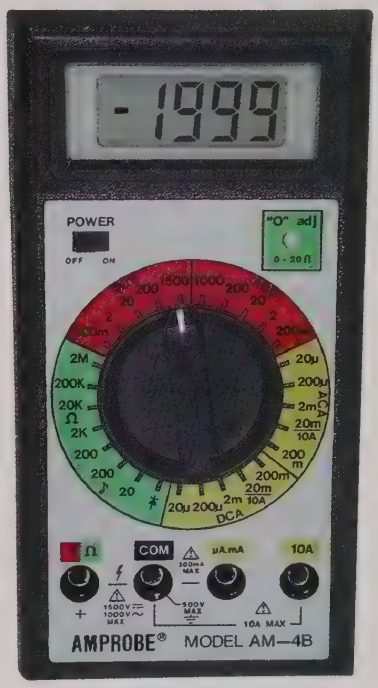
*Also uses 15 Amp fuse; KLK 15
**Also uses 10 Amp fuse; 6.3X25-10-12
***Extendo Leads, also available in "Wide Temperature Range"-40 to 120°F; VLK-411R-WTR
****Also requires fuse for transmitter; 2502-6X32
*****Refer to data sheet for details
******All Purpose Modular Test Lead and Accessories

DIGITAL MULTIMETERS

DIGITAL MULTIMETERS

DIGITAL MULTIMETERS		AM-4B	AM-12	AM-14	AM-15	AM-16	AM-18	AM-20	AM-21	AM-22	AM-50	AM-52	AM-53	AM-55	AM-56	AM-57	AM-59	AM-71	AM-90	AM-91	AM-1200	AM-1250	AM-1260	AM-1280	CDM-1	PMM-1
AC VOLTAGE	m/V	X		X							X	X	X	X	X	X	X	X	X	X		X	X	X		
	<500V							X	X	X															X	
	600V				X	X	X				X	X	X	X	X	X	X									X
	750V		X	X														X	X	X	X	X	X	X		
	1000V	X																								
DC VOLTAGE	mV	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
	600V				X	X	X				X	X	X	X	X	X	X									X
	1000V	X	X					X	X	X								X	X	X	X	X	X	X		
AC AMP.	µA	X										X				X	X	X	X	X						
	mA	X	X	X	X	X						X		X	X	X	X				X	X	X	X		
	10A	X	X	X	X	X								X	X	X	X	X	X	X	X	X	X	X		
DC AMP.	µA	X	X					X	X	X		X				X	X	X	X	X						
	mA	X	X	X	X		X	X	X	X						X	X	X	X	X	X	X	X	X		
	10A	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X			
3.5 Digits or 3-1/2)		X	X	X	X	X	X	X	X	X											X	X	X			
3.75 Digits or 3-3/4)											X	X	X	X	X	X	X							X	X	X
4.75 Digits or (4-3/4)																		X	X	X						
2000 Counts		X	X	X	X	X	X	X	X	X											X	X	X			
3200 Count																									X	X
4000 Count											X	X	X	X	X	X	X	X	X	X				X		
40000 Count																		X	X	X						
True RMS AC+DC Voltage																				X						
True RMS AC													X		X		X	X		X		X	X			
Dual Display																		X	X	X						
Back Light Display																				X						
Frequency Response Hz	50/60																								X	X
(AC Volts & Amps)	40/400	X	X	X	X	X	X	X	X	X	X				X			X				X			X	
	>1kHz												X		X	X	X		X	X		X	X			
Ohms		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Continuity		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Conductance																		X	X	X						
Diode Test		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Capacitance												X	X	X	X	X	X	X	X	X				X		
Frequency Measuring									X	X		X	X	X	X	X	X	X	X	X				X		
Duty Cycle																			X	X						
Data Hold											X	X	X	X	X	X	X	X	X	X				X	X	X
Auto/Manual Ranging				X	X	X	X				X	X	X	X	X	X	X	X	X	X				X	X	X
APO					X		X	X			X	X	X	X	X	X	X	X	X	X				X	X	X
dbm																				X						
Temperature				X							X	X	X	X	X	X	X									
*T_1, T_2, T_1-T_2 Temperature												X				X	X									
Lo Battery Indicator		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bar Graph Display											X	X	X	X	X	X	X	X	X	X				X	X	X
Record											X	X	X	X	X	X	X	X	X	X				X		
Relative Zero											X	X	X	X	X	X	X	X	X	X				X		
Relative % Change																		X	X	X						
Rubber Holster		X		X	X	X					X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Harmonic Index (HIX)													X		X		X									
% 4-20mA												X			X	X										
Catalog Page Number		48	49	49	50	51	51	52	52	52	53	53	53	53	53	53	53	56	58	58	60	61	61	62	67	63

AM-4B



AM-4B

FEATURES

- Buzzer on 0-200Ω range
- Diode Test Range
- Reversed polarity indication
- Low battery indication
- Over-range indication
- Sensitive 20µA/20Ω ranges
- .01Ω Resolution

SPECIFICATIONS

Voltage Ranges:
0.1.999/19.99/199.9/1000VAC
0-1.999/19.99/199.9/1500VDC
0-199. 9mV AC/DC

Resistance Ranges:
0-19.99 ohms
0-199.9 ohms with buzzer
0-199.9 ohms without buzzer
0-1.999/19.99/199.9/1999K ohms
Special diode test range: 2mA ± 1 at 0-1.999VDC

Current Ranges:
0-19.99/199.9mA AC/DC (AC accuracy may be affected by outside interference)
0-1.999/19.99/199.9mA AC/DC
0-10 Amps AC/DC

Input Impedance: 10MΩ

Operating Temperature / Humidity: + 32°F to + 120°F (0°C to + 48.8°C), 80% RH

Response Time: 2.5 seconds, except AC volts & AC A/mA, which are 3.5 seconds

Sampling Rate: 2.5 times / second

Power Supply: One 9V alkaline battery MN1604 (not supplied)

Battery Life: 175 hours

Case Voltage Breakdown: 3000VAC

Circuit Protection: Microamp (µA) and milliamp (mA) ranges are fuse protected up to 600 volts AC/DC. Do not use substitute fuses. Resistance ranges are protected against momentary misapplication of up to a maximum of 550VAC/DC for not more than 15 seconds. The 10 ampere range is overload protected up to 15 amperes maximum not fuse protected. All voltage ranges are overload protected up to 1000VAC and 1500 VDC.

Accuracy: DC: ±0.8% of reading ± 1LSD
AC Volts: ±1.25% of reading ± 3LSD based on sinusoidal waveform of 40Hz to 1 KHz, except 1000V, which is based on sinusoidal waveform of 40Hz to 400Hz

AC Amps: ± 1.5% of reading ±3LSD based on sinusoidal waveform of 40Hz to 1KHz, except 10 amp range, which is 2.5% of reading ± 4LSD based on sinusoidal waveform from 40Hz to 400Hz. (Accuracy on 0-20/200µA ranges may be affected by outside interference.)

Resistance: ± 1% of reading ±2LSD

The AM-4B features auto-zeroing on all ranges except the very sensitive 0-20Ω range where it may be necessary to use the ohm zero adjustment screw (marked 0-20Ω "0" adj) to zero the instrument

Size: 6-7/8"L x 3-1/2"W x 1-9/16"D (17.46cm x 8.89cm x 3.96cm)

Weight: 12.36 oz. (350gm) without battery. Supplied with MTL-4B test leads

ACCESSORIES & REPLACEMENTS

Test Leads	MTL-4B or 1200
Fuse	6.3 x 25 - 2 - 12
Battery (9 Volt - not supplied)	MN-1604
Instruction Book	P/N 925786

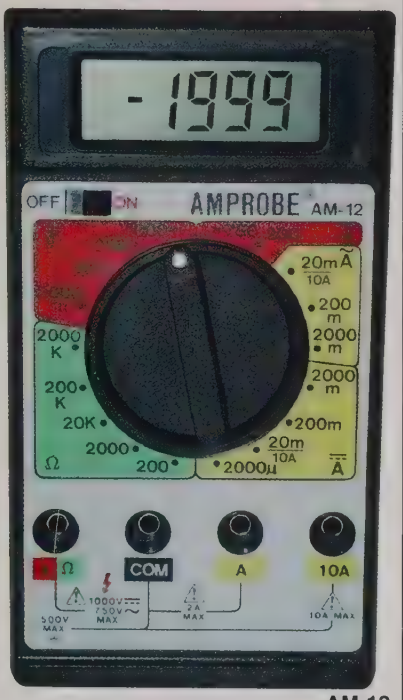
MODEL TAM-4B & TAM-1280 TEST MASTER KITS
A powerhouse of testing capability in deluxe attache carrying case model MM-45. Contains AM-4B or AM-1280 digital multimeter, A663-4B AC clamp on current transducer, MTL-4B or MTL-1200 test leads, HV-2* 15KVAC/DC test voltage probe with HVR-4 resistor, and
ACL-4B, ACL-1280 leakage detector.

* For use on high impedance low energy devices only. Not for power distribution lines.

AM-12, AM-14

FEATURES

- Direct temperature reading in degrees C & degrees F (AM-14 only)
- .1 ohm resolution on 200 ohm range
- Safety leads and replaceable probe tips
- Over-range indication
- Low battery indication
- Auto zeroes on all ranges
- Reversed polarity indication
- Audible continuity
- Diode test range (AM-14 only)
- 200mV/20M Ω ranges (AM-14 only)
- Convenient intermediate size
- Banana jacks
- Accessories add power, leakage, high current (6,000 amps - AM-14 only), temperature and 15KV AC/DC testing capability.
- 1 µA DC resolution - handy for oil burner applications (AM-12 only)
- Large recessed 3 1/2 digit LCD readout, yet a compact size



AM-12

SPECIFICATIONS AM-12

Voltage: 0-199.9/750VAC; 0-1999 mVDC/0-1.999/19.99/199.9/1000VDC.
Resistance Ranges: 0-199.9/1999 Ohms; 0-19.99/199.9/1999K Ohms
Current Ranges: 0-1999 uA DC; 0-19.99/199.9/1999 mA AC/DC; 0-10 Amps AC/DC
Note: AC accuracy may be affected by outside interference
Digit size: 1/2" LCD
Case Voltage Breakdown: 3000VAC
Accuracy: DCV: ±0.5% of Rdg ± 2 LSD; ACV: ±1.5% of Rdg ± 2 LSD; DC Amps: All ranges ±1.0% of Rdg ± 2 LSD except 10 amp range, which is ±1.5% of Rdg ± 3 LSD; AC Amps: All ranges ±1.5% of Rdg ± 2 LSD except 10 amp range, which is ± 2.0% of Rdg ± 3 LSD; Ohms: All ranges ±0.75% of Rdg ± 2 LSD except 2MΩ range, which is ± 1% of Rdg ± 2 LSD
Input Impedance: 10 Megohms
Circuit Protection: Microamp (µA) and milliamp (mA) ranges are fuse protected (up to 600 volts AC/DC maximum). Do not use substitute fuse. All resistance ranges are protected against momentary misapplication of up to a maximum of 500V AC/DC for no longer than 10 seconds.The 10 ampere range is overload protected up to 15 amperes maximum (not fused). All voltage ranges are overload protected up to 800 VAC and1100 VDC.
Power Supply: One 9V alkaline battery, not supplied.
Battery Life: 175 hours
Operating Temperature/Relative Humidity: 32° to 120°F (0° to 48.8°C), 80% RH
Storage Temperature/Relative Humidity: 0° to 140°F (-18° to 60°C), 80% RH with battery removed
Sampling Rate: 2.5 times/second
Response Time: 3 seconds
Size: 5-1/2" x 3" x 1" (13.98cm x 7.62cm x 2.54cm)
Instrument Weight: 5 oz. (141.75 grams) without battery.

AM-14

SPECIFICATIONS AM-14

Voltage: 0-1.999/19/99/199.9/750VAC; 0-1.999/19.99/199.9/1000VDC; 0-199 9mV AC/DC
Resistance Ranges: 0-199.9 ohms; 0-199.9 ohms with buzzer; 0-1.999/19.99/199.9 K ohms; 0-1.999/19.99 M ohms. Special diode test range: 2mA @ 1.999 VDC
Current Ranges: 0-1.999/19.99/199.9/1999mA AC/DC; 0-10 amps AC/DC
Temperature Ranges: -40°F to 300°F; -40°C to 148.8°C. Temperature range capability is available through use of optional temperature probes Model TPI-14 (immersion), TPS-14 (surface), and TPA-14 (air, +150°F max).
Accuracy: DC (Volts & Amps): ±0.8% of reading ± 1 LSD. AC (Volts & Amps): ±1.5% of reading ± 1 LSD based on sinusoidal waveform of 40 to 400Hz. All ohms ranges: ± 1% of reading ± 2 LSD 10 amp AC/DC: ±2.5% of reading ± 3 LSD
Input Impedance: 10MΩ
Response Time: Not more than 2.5 seconds
Sampling Rate: Not less than 2.5 times/second
Battery Life: More than 175 hours
Case Voltage Breakdown: 3000VAC
Circuit Protection: The milliamp ranges are fuse protected up to 600 volts AC/DC with a 2 amp fuse. Do not substitute fuses. All resistance ranges are protected against momentary misapplication of up to a maximum of 500VAC/DC for no longer than 10 seconds. The 10 amp range is overload protected for up to 15 amps maximum. All voltage ranges are overload protected for up to 800VAC and 1100VDC.
Power Supply: One 9V alkaline battery, Model MN-1604, not supplied.
Operating Temperature/Relative Humidity: +32°F to 104°F (0°C to +40°C): 80% RH
Size: 6"H x 3-1/4"W x 1-3/8"D (15.24cm H x 8.25cm W x 3.49cm D)
Weight: 9.5 oz (269 gm) instrument & leads

ACCESSORIES AND REPLACEMENTS

Test Leads	MTL-12	Instruction Book (AM-14)	P/N 925780
Fuse	6:3 x 25 - 2 - 12	Instruction Book (AM-12)	P/N 948787
Battery 9V (not supplied)	MN-1604	Carry Case	SV-1

Model TAM-14 Industrial Multimeter Testmaster Kit - A powerhouse of testing capability in a professional carrying case. Contains AM-14 digital multimeter, A663-4B AC Clamp-On Current Transducer, MTL-12 Safety Test Leads, HV-2 15KV AC/DC Probe with HVR-4 Resistor, ACL-14 Leakage Detector, TPA-14 Air Temperature Probe, and TPS-14 Surface Temperature probe, all packed into MM-14T Carrying Case.

AM-15

AM-15

FEATURES

- Direct measurement of AC/DC Voltage, AC/DC Current, Resistance, Diode Check and Continuity Buzzer
- Built-in test probe holder for convenient two hand operation and storage.
- Auto power OFF
- Auto and manual ranging
- Push button offset to automatically compensate for lead impedance
- Data hold button
- Choice of LO or HIGH power ohms
- Supplied with 9V battery, safety test leads and instructions
- Low battery indicator
- Over-range indicator
- Automatic polarity indication
- 0.1 ohm resolution on 200 ohm range

200.0 mA range fused to 600 volts AC/DC to help protect instrument as well as user from mis-application.

SPECIFICATIONS

Voltage Ranges: 0-1.999/19.99/199.9/600VAC
0-1999/19.99/199.9/600VDC
0-199.9mVDC

Resistance Ranges: 0-199.9 OHMS
0-1.999/19.99/199.9K Ohms
0-1.999M Ohms

"Low Ω" (Low Voltage Ohms) does not have a 200Ω range. Its open circuit voltage is made intentionally low so that it will not forward bias any semiconductor in parallel with any low resistance that is to be measured. "Ω" (Hi Voltage Ohms) has an open circuit voltage of approximately 500mV.

Current Ranges: 0-199.9mA AC/DC
0-10 Amps AC/DC (10 Amp circuit is unfused. Do not exceed 10 Amps).

Accuracy: DC Volts ±0.5% of Reading, ±2 LSD
DC Amps ±0.75% of Reading, ±2 LSD on 200mA Range
DC Amps ±1.5% of Reading, ±3 LSD on 10 Amp Range
AC Volts ±1.25% of Reading, ±5 LSD (40-500Hz)
AC Amps ±1.25% of Reading, ±3 LSD (40-500Hz) on 200mA Range
AC Amps ±2% of Reading, ±5 LSD (40-500Hz) on 10 Amp Range

Ohms: 200Ω range ±0.75% of rdg ±4 LSD
2K, 20K, 200K ranges ±0.75 of rdg±2 LSD
2M range ±1.0% of rdg ±3 LSD

Diode Checking and Continuity: Accuracy ±1.5% Reading, ±5 LSD
Input Impedance: 10MΩ
Response Time: Not more than 5 seconds
Sampling Rate: 2 times/second
Battery Life: Approximately 500 Hours
Polarity Indication: Yes
Over-Range Indication: "1" flashing
Case Voltage Breakdown: 4000 Volts AC
Temperature Measurement: Available with TMA-1 accessory.
Operating Temperature/Humidity: +32°F (0°C) to 120°F (50°C); 80% RH
Storage Temperature/Humidity: +20°F (-6°C) to 140°F (60°C); 80% RH
Power Supply: 9V battery (supplied)
Auto Power OFF: Approximately 30 minutes
Continuity with Buzzer: 0-150Ω
Weight: 10.4oz. (295 gms)
Size: 6 1/2" x 2 3/8" x 1" (16,51 cm x 6.03 cm x 2.54 cm)
Fuse: 2 Amp 600 Volts - 6.3x25-2-12
Leads: MTL-15
Circuit Protection: The Diode Check, Continuity and Ohms ranges are protected for misapplication of voltage up to a maximum of 550V AC/DC for not longer than ten seconds. All voltages, AC and DC are overload protected to a maximum of 700 Volts. The 200 milliamp range, AC or DC, is fuse protected by a 2 Amp 600 Volt fast blow fuse. Its interrupting capacity is 500 Amps maximum.

ACCESSORIES AND REPLACEMENTS

High Voltage Probe/Resistor	HV-2/HVR-4
Soft Vinyl Zippered Pouch for AM-15	SV-1
2 Amp Fuse for AM-15	6.3x25-2-12
9V Alkaline Battery for AM-15	MN-1604
Multi-Temp Accessory	TMA-1
Replacement Test Leads	MTL-15
Holster	H-15Y
Instruction Book	P/N 965750

AM-16 & AM-18

FEATURES

"TRADESMEN SERIES"
- Protective holster, tilt stand, test probe holders
- Auto and manual ranging
- 3-1/2 Digit, 2000 count annunciated LCD display
- Capacitance to 1000µF (AM-18 only)
- Choice of Lo or High power ohms (AM-18 only)
- Push button offset to compensate for lead impedance (AM-18 only)
- Data hold button
- Input jack alarm (AM-18 only)
- Full annunciated display
- Supplied with battery, test leads and instruction manual
- Auto power OFF (AM-18 only)

SPECIFICATIONS

Model	DCV	ACV	DCA	ACA	CAP	→+	•)))	Ohms	LO/HI Ohms
AM-16	✓	✓				✓	✓	✓	
AM-18	✓	✓	✓	✓	✓	✓	✓	✓	✓

DC Voltage AM-16: Range: 200mV, 2V, 20V, 200V, 600V
Resolution: .1mV to 1V
Accuracy: 200mV Range: ±1.2% rdg + 3 digits, ±0.8% rdg + 2 digits on all other ranges
Overload Protection: 600 VD; Input Impedance: 10MΩ
DC Voltage AM-18: Range: 200mV, 2V, 20V, 200V, 600V
Accuracy: 200mV Range: ±0.8% rdg + 2 digits, ±0.5% rdg + 2 digits on all other ranges
AC Voltage AM-16 & AM-18: 50Hz to 400Hz Frequency Response; Ranges: 2V, 20V, 200V, 600V
Accuracy: AM-16: ±1.9% rdg + 6 digits AM-17, AM-18: ±1.5% rdg + 4 digits
Resolution: 1 mV to 1V; Input Impedance: 10MΩ
Conversion Type: Average sensing, RMS calibrated; Overload Protection: 600VAC
DC Current AM-18 Only: Ranges: 2mA, 200mA, 10A
Accuracy: mA ranges: ±1.0% rdg + 2 digits, 600mV burden
10A range: ±2.5% rdg + 3 digits, 900mV burden; Resolution: mA ranges: 1µA, 100µA; 10A range: 10mA
AC Current AM-18 Only: 50 Hz to 400 Hz Frequency Response; Range: 2mA, 200mA, 10A
Accuracy: mA ranges: ±1.5% rdg + 4 digits, 600mV RMS burden
10A range: ±2.9% rdg +5 digits, 900mV RMS burden
Conversion Type: Average sensing, RMS calibrated
Resistance: Range: 200Ω, 2KΩ, 20KΩ, 200KΩ, 2MΩ, 20MΩ
Resolution: 0.1Ω, 1Ω, 10Ω, 100Ω, 1KΩ, 10KΩ; Accuracy:AM-16 - 200Ω range, ±1.2% rdg + 4 digits
AM-18 - 200Ω range, ±1.0% rdg + 4 digits; AM-16-2KΩ, 20KΩ, 200KΩ, 2MΩ ranges, ±1.0% rdg +2 digits
AM-18-2KΩ, 20KΩ, 200KΩ, 2MΩ ranges, ±0.8% rdg + 2 digits
AM-16 - 20MΩ range: ±2.0% rdg + 5 digits; AM-18 - 20MΩ range: ±1.9% rdg + 5 digits
Open Circuit Test Voltage on 200Ω Range: AM-16 - 400mV, AM-17, AM-18 - 3.3V max 2KΩ thru 20MΩ ranges. AM-16; 400mV, AM-17, AM-18 - 350mV for Lo Power, Ohms, 660mV for Hi Power Ohms
Diode Check and Continuity Test: AM-16: Diode check - max test current 0.5mA, max open circuit voltage 1.5V. Continuity Check - <380Ω buzzer will sound
Overload Protection - 600VDC/RMS AC max. AM-18: Diode Check-Max Test Current 1.5mA, max open circuit voltage 3.3V. Continuity Check - come on <25Ω, turn off >200Ω
Overload Protection: 500 VDC/RMS AC max; Response Time: 0.2m sec.
Capacitance AM-18 Only: Range: 2µF, 20µF, 1000µF; Resolution: 1nF, 10nF, 1µF
Accuracy: 2µF, 20µF ranges: ±1.9% rdg + 5 digits at >10% full scale
1000µF range: ±2.9% rdg + 20 digits
Test Frequency: 2µF range 320Hz, 20µF range 32Hz, 1000µF range 16Hz; Max. Test Voltage: 3.3V peak
Overload Protection: 500VDC/RMS AC
Display: 3 ½ digit, 2000 count LCD **Ranging:** Auto or Manual
Automatic Polarity Indication: "–" displayed for negative input **Over-Range Indication:** "1" Flashing
Auto Zero on All Ranges
Low Battery Indicator: " " displayed when battery needs replacement
Sampling Rate: 2 times/second **Battery Life:** Greater than 400 hours
Case Breakdown Voltage: 3000VAC
Auto-Power OFF: Model AM-18 approximately 30 minutes
Power Source: AM-18 - 9V battery P/N (MN1604), AM-16 - 2 pcs (AAA) P/N (S912)
Operating Temperature/Relative Humidity: ±32°F to 120°F (0°C to +50°C) @80%RH
Storage Temperature/Relative Humidity: -4°F to 140°F (-20°C to +60°C) @80%RH
Input Jack Alarm: AM-18 Only
Size with Holster (WxLxH): AM-16 - 3.15" x 6.50" x 1.42" (8.0cm x 16.5cm x 3.6cm)
AM-18 - 3.40" x 6.50" x 1.57" (8.7cm x 16.5cm x 3.6cm)
Weight: AM-16, AM-18 =`10.6 oz. (300 gms)
Circuit Protection: Micro-Amp (µA) and milliamp (mA) ranges are fuse protected up to 600 volts AC/DC maximum with Cat. No. 6.3x25-2-12 two amp fuse. **DO NOT USE SUBSTITUTE FUSES.** All resistance ranges are overload protected against momentary mis-application of up to a maximum of 500 volts AC/DC for no longer than 10 seconds. The 10 ampere range (AM 18) is fuse protected up to 600 volts AC/DC maximum with Cat. No. 6.3x25-10-12, 10 amp fuse. **DO NOT USE SUBSTITUTE FUSES.**

ACCESSORIES AND REPLACEMENTS

Test leads	MTL-18
Fuse	6.3x25-2-12
Fuse (10A AM-18 only)	6.3x25-10-12
Holster	H-16Y, H-18Y
Instruction Book	P/N 973750
Battery 9V(AM-18)	MN1604
Battery 1.5 AAA (AM-16) 2 req.	S912

AM-16

AM-18

AM-20, AM-21 & AM-22

"Spartan Series"AM-21

FEATURES

SPARTAN SERIES
- Tilt stand
- Compact size
- Economically priced
- 3½ Digit, 2000 count annunciated LCD display
- Supplied with 9V battery, test leads and instruction manual

Fused to 550 volts AC/DC to help protect instrument as well as user from mis-application

SPECIFICATIONS

DC Voltage:

Range:	200mV, 2V, 20V, 200V, 1000V
Resolution:	0.1 mV to 1V
Accuracy:	± 1.0% rdg + 2 digits on all ranges
Overload Protection:	1100 VDC
Input Impedance:	10 MΩ on all ranges

AC Voltage for AM-20, AM-21: @ 50Hz-500Hz

Range:	200V, 500V
Resolution:	0.1V, 1V
Accuracy:	±2% rdg +5 digits on all ranges
Overload Protection:	600VAC
Input Impedance:	750K on all ranges

AC Voltage for AM-22: @ 50 Hz-500Hz

Range:	2V, 20V, 200V, 500V
Resolution:	1mV to 1V
Accuracy:	±1.5% rdg + 4 digits on all ranges
Overload Protection:	600VAC on all ranges
Input Impedance:	10MΩ on all ranges

DC Current:

Range:	200µA, 20mA, 2000mA, 10A
Resolution:	.1µA to 10mA
Accuracy:	±1.5% rdg + 2 digits on µmA ranges; ±3% rdg to + 2 digits on 10A range
Circuit Protection:	550 VAC/VDC by 600V fuse.
Voltage Burden:	0.3V max.

AC Current for AM-22: @ 50Hz - 500Hz

Range:	200µA, 20mA, 2000mA, 10A
Resolution:	.1µA to 10mA
Accuracy:	±2% rdg + 5 digits on µ/mA ranges ±4% rdg + 5 digits on 10A range
Circuit Protection:	550 VAC/VDC by 600 volt fuse; 10A input unfused
Voltage burden:	0.3V max

Resistance:

Range:	200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, (20MΩ AM-20 & 22 only)
Resolution:	0.1Ω to 10kΩ
Accuracy:	±2.5% rdg + 3 digits on 20MΩ range ±0.8% rdg + 2 digits on other ranges
Overload Protection:	500 VAC/VDC for 10 sec.
Test Voltage:	200 Ω range 3.2V max other ranges 1.0V max

Diode Test:

Test Current:	1.0 ±0.6 mA
Test Voltage:	3.2V max
Overload Protection:	500 VAC/VDC for 10 sec.
Continuity Test:	(Audible) •)) Threshold: < 4Ω

Frequency Measurement for AM-21, AM-22:

Range:	1 Hz to 20 MHz autorange, TTL level
Accuracy:	±0.1% rdg + 2 digits
Overload Protection:	500 VDC/VAC for 10 sec.
Display:	3-1/2 digits LCD
Power Supply:	9 Volt battery (supplied)
Instruction Book:	P/N 972750
Weight:	7.7 oz (220 gm)
Dimensions:	4.72"L x 2.95" W x 1.18"H (12cm L x 7.5cm W x 3.0cm H)
Polarity Indication:	Yes
Low Battery Indication:	"BAT"
Operation Temperature:	0° to 45°C @ 80% RH
Storage Temperature/Humidity:	0 to 50°C @ 80% RH
Case Breakdown Voltage:	3000 VAC
Sampling Rate:	3 Times/sec
Test Leads:	MTL-20
Fuse Part No.:	6.3x25-2-12
Battery Life:	Greater than 200 hours (MN1604)
Optional Carrying Case:	Cat. No. SV

Model	DCV	ACV	DCA	ACA	Hz	•))	→|	Ohms
AM-20	✓	✓	✓			✓	✓	✓
AM-21	✓	✓	✓		✓	✓	✓	✓
AM-22	✓	✓	✓	✓	✓	✓	✓	✓

Circuit Protection: Micro-amp (µA) and milliamp(mA) ranges are fuse protected up to 550volts AC/DC maximum with a 6.3x25-2-12 two amp fuse. Do not use substitute fuses. All resistance ranges are overload protected against momentary misapplication of up to a maximum of 500V AC/DC for no longer than ten seconds. The 10 ampere range is overload protected up to 10 amperes maximum.

AM-50s Series

FEATURES

The Amprobe AM-50 Series are hand held, battery operated, professional quality, digital multimeters designed for today's complex HVAC/R, Electrical and Electronic system diagnostics and troubleshooting.

The Series includes AM-50, AM-53, AM-55 & AM-56 to provide different function combinations of DC Voltage, AC Voltage, Harmonics Index™ (HIX), Temperature, Frequency, Resistance, Continuity Test, Capacitance, Diode Test, DC Current as well as AC Current.

Pushbutton functions include Data Hold, Auto or Manual Ranging, Relative Zero Mode, Record MAX/MIN/MAX-MIN/AVG as well as Secondary Function selections.

The entire AM-50 Series is housed inside a gasket sealed casing which keeps out grease, oil, dirt and moisture to maintain superb accuracy and reliability. Besides, the casing is made of high impact, thick wall fire retardant material to maximize durability of the meter, and safety to the user.

ISO 9002 System Certified

CE

AM-50

AM-53

SELECTION GUIDE

	AM50	AM52	AM53	AM55	AM56	AM57	AM59
4 Digits 9999 Counts	√	√	√	√	√	√	√
4 Times/Sec Data Updates	√	√	√	√	√	√	√
Bargraph Update 20 Times/Sec	√	√	√	√	√	√	√
4 Selectable Sensitivites on Hz		√	√	√	√	√	√
Auto Ranging Record (Max, Min, Max-Min, Avg)	√	√	√	√	√	√	√
Relative Zero	√	√	√	√	√	√	√
Data Hold	√	√	√	√	√	√	√
Auto Power Off	√	√	√	√	√	√	√
True RMS			√		√		√
DCV 999.9mV to 600.0V Ranges	√	√	√	√	√	√	√
ACV 999.9mV to 600.0V Ranges	√	√	√	√	√	√	√
DC/AC µA current		√				√	√
DC/AC mA current		√				√	√
% of 4-20mA measurement		√				√	√
DC/AC 4000mA Range				√	√	√	√
DC/AC 10 Amp Range				√	√	√	√
Ohm (999.9Ω to 40.00MΩ) Ranges	√	√	√	√	√	√	√
Temperature (-20°C to 500°C/0°F to 932°F) Range	√	√	√	√	√	√	√
Differential Temperature (T_1-T_2)		√				√	√
Capacitance (1.000uF to 10.00mf) Ranges		√	√	√	√	√	√
Frequency 9.999Hz to 50.00kHz		√	√	√	√	√	√
Harmonics Index (0.0% to 99.9%)					√		√
Fast Audible Continuity	√	√	√	√	√	√	√
Diode Test	√	√	√	√	√	√	√
Splash Proof & Fire Retardant Design	√	√	√	√	√	√	√
6.5kV Transient Protection	√	√	√	√	√	√	√
600V HBC Fuse on 4000mA & 10ACurrent Inputs				√	√	√	√
250V 5x20mm Fuse on uA & mA inputs		√				√	√

GENERAL SPECIFICATIONS

Display: 4 Digits 9999 counts LCD
Polarity: Automatic
Update Rate:
Data: 4 per second nominal;
42 Segments Bar graph:
20 per second max
Low Battery: Low battery indicator appears when the battery voltage drops below approx. 7.2VDC
Operating Temperature: 32°F to 95°F (0°C to 35°C), 0-80% R.H. 95°F to 104°F (35°C to 40°C) 0-70% R.H.
Storage Temperature: -4°F to 131°F (-20°C to 55°C), 0-80% R.H. (with battery removed)
Temperature Coefficient: Nominal 0.15 x (specified accuracy)/°C @(0°C-18°C) or 28°C-40°C
Power Supply: Single 9V battery; NEDA 1604, JIS006P or IEC6F22
APO Timing: Idle for 4 minutes
APO Consumption: 30µA Typical
Overload Protections

Safety: The instruments meet the requirements for double insulation, pollution degree 1, to IEC1010-1(1995), EN61010-1(1995), UL3111-1(6.1994), CSA C22.2 NO. 1010-1-92 to:
Terminal V/R: Installation category III, 600V ac & dc
Terminal mA/A: (AM55 & AM56 only)
Installation category III, 600 Volts ac.
Installation category II, 250 Volts dc.
E.M.C.: Meets EN55011(3.1991) and EN50082-1(1992)
Sensing: True RMS for AM53 & AM56; Average responding for AM50 & AM55
Dimension: 5.85"L(150mm)x2.9"W(75mm)x1.33"(34mm) without holster; 6.24"L(160mm)x3.2"W(82mm) x1.87"H(48mm)with holster
L160mmxW82mmxH48mm (with holster)
Weight: Approximately .55 lb. (252 gm) without holster; Approximately .76 lb. (345 gm) with holster
Power Consumption: 3.5 mA Typical
Accessories: Test leads (pair), battery installed and user's manual
Special Features: Autoranging Record (Max, Min, Max-Min, Avg, Autoranging Relative (Zero), and Data Hold

(cont'd. on next page)

AM-50s Series (cont'd.)

AM-55

AM-56

ELECTRICAL SPECIFICATIONS

ACCURACY IS ± (% READING DIGITS + NUMBER OF DIGITS) OR OTHERWISE SPECIFIED, AT 23°C ±5°C & LESS THAN 75% R.H.

DC VOLTAGE ACCURACY

Range	AM50	AM52	AM53	AM55	AM56	AM57	AM59
999.9 mV 9.999 V 99.99 V	0.4%+4d	0.15%+3D	0.3%+3d			0.15%+3d	
600.0 V	0.4%+5d	0.4%+5D	0.3%+5d			0.4%+5d	

NMRR: >50dB @50/60Hz
CMRR: >100dB@DC, 50/60Hz, Rs=1kΩ
Input Impedance: 10MΩ, 30pF nominal (16MΩ nominal for 999.9mV range)

AC VOLTAGE ACCURACY

Range	AM50	AM52	AM53*	AM55	AM56*	AM57	AM59*
999.9 mV 50Hz-200Hz	2.5%+5d	2.5%+8d	2.5%+5d			2.5%+8d	
9.999 V 50 Hz-500Hz 99.99V 50Hz-500Hz 600.0V 50Hz-500Hz	1.5%+4d	2.5%+8d	1.2%+4d	1.5%+4d	1.2%+4d	1.25%+3d	1.1%+3d
9.999 V 50 Hz-2Hz 99.99V 500Hz-2kHz 600.0V 50Hz-500Hz	Unspec'd		2.0%+5d	Unspec'd	2.0%+5d**	Unspec'd	1.8%+3d**

CMRR: >60dB@DC to 60Hz, Rs=1kΩ
Input Impedance: 10MΩ, 30pF nominal (16MΩ nominal for 999.9mV range)
Trms Crest Factor: <3:1 at full scale, and <6:1 at half scale
*True RMS Specified from 5% to 100% of range
**True RMS Specified from 10% to 100% of range

DC CURRENT ACCURACY

Range	AM50	AM52	AM53*	AM55	AM56	AM57	AM59*
40.00uA	N/A	0.3%+4d	N/A	N/A	N/A	0.3%+4d	0.25%+3d
400.0uA	N/A	0.2%+3d	N/A	N/A	N/A	0.2%+4d	0.15%+2d
4.000mA	N/A	0.3%+4d	N/A	N/A	N/A	0.3%+4d	0.25%+3d
40.00mA	N/A	0.2%+3d	N/A	N/A	N/A	0.2%+3d	0.05%+3d
4000mA	N/A	N/A	N/A	0.9%+4d	0.9%+4d	0.6%+4d	0.5%+4d
10.00A*	N/A	N/A	N/A	0.l7%+3d	0.7%+3d	0.4%+3d	0.3%+3d

Burden Voltage: 0.03V/A
*10A Continuous; 20A for 30 Second Max with 5 minutes cool down interval

AC CURRENT ACCURACY

Range	AM50	AM52	AM53*	AM55	AM56*	AM57	AM59*
400.0uA 50 Hz-500Hz	N/A	1.2%+3d	N/A	N/A	N/A	1.2%+3d	1.0%+3d
40.00mA 50 Hz-500Hz	N/A	1.2%+3d	N/A	N/A	N/A	1.2%+3d	1.0%+3d
4.000mA 50 Hz-500Hz	N/A	N/A	N/A	2.0%+6d	2.0%+6d**	1.2%+4d	1.0%+4d
10A*** 50 Hz-500Hz	N/A	N/A	N/A	1.2%+5d	1.2%+4d	1.2%+4d	1.0%+4d
400.0uA 500-2Khz	N/A	1.8%+3d	N/A	N/A	N/A	1.8%+3d	1.5%+3d
40.00mA 500-2Khz	N/A	1.8%+3d	N/A	N/A	N/A	1.8%+3d	1.5%+3d
4000mA 500-2Khz	N/A	N/A	N/A	unspec'd	3%+5d	1.8%+4d	1.5%+4d
10 A*** 500-2Khz	N/A	N/A	N/A	unspec'd	3%+5d	1.8%+4d	1.5%+4d

*True RMS Specified from 10% to 100% of range
**True RMS Specified from 25% to 100% of range
***10A Continuous: 20A for 30 Second Max with 5 minutes cool down interval
Burden Voltage: 0.03V/A

AM-50s Series (cont'd.)

HARMONICS INDEX™ HIX (AM-56 AND AM-59 only)

Range	0.0% to 99.9%	
Input Voltage	500mVAC to 600VAC	(30mVAC to 750VAC - AM59 only)

Harmonics Index™ (HIX) function generates a value between 0% to 100% to indicate the deviation of non-sinusoidal to a sinusoidal waveform, which is a good indication of the presence of harmonics. Pure sinusoidal waveforms without harmonics have a harmonics index™ value of 0%. The higher the harmonics index™ value, the more the harmonics are present.

HIX can effectively indicate the presence of Voltage Harmonics in most cases by a comparative percentage index. Harmonics normally appear in the Current waveforms, however, the current harmonics can distort the system voltage waveform and cause voltage harmonics.

OHMS ACCURACY

Range	AM50	AM52	AM53*	AM55	AM56*	AM57	AM59
999.9 Ω	1.5%+4d	0.5%+5d	0.5%+6d			0.5%+5d	
9.999kΩ	1.2%+3d	0.5%+2d					
99.99kΩ	1.2%+3d	0.5%+2d					
999.9kΩ	1.5%+3d	0.8%+2d					
4.000MΩ	1.5%+3d	0.8%+2d					
40.00MΩ	4%+3d	1.5%+2d					

Open Circuit Voltage: Typical 1.3 VDC (2.7 VDC @999.9Ω Range)

CAPACITANCE ACCURACY

Range	AM50	AM52	AM53*	AM55	AM56*	AM57	AM59
1.000uF	N/A	1.0%+4d				1.0%+4d	
10.00uF	N/A	1.0%+3d				1.0%+3d	
100.0UF	N/A	1.0%+3d				1.2%+3d	
1.000MF	N/A	2.0% + 4d				1.5%+4d	
10.00mF	N/A	4.0% + 5d				4.0%+5d	

*Accuracies with film capacitors, or capacitors that have negligible dielectric absorption

FREQUENCY ACCURACY

Range	AM50	AM52	AM53*	AM55	AM56*	AM57	AM59
9.999Hz	N/A	0.04%+4d					
99.99Hz 999.9Hz 9.999kHz 50.00kHz	N/A	0.02%+4d				0.05%+4d	

Selectable Sensitivities: 1Vrms, 2Vrms, 20Vrms, & 200Vrms (by RANGE button)
Input Signal: Sine wave, or Square wave with duty cycle >40% & <70%

TEMPERATURE ACCURACY

Range	T_1 or T_2
-20°C to 300°C / 0°F to 572°F	±(3°C+1d) / ±(6°F+2d)
301°C to 500°C / 573°F to 932°F	±(2%+1d) / ±(2%+2d)

Sensor: "K" Type Thermocouple, sensor accuracy not included.
Temperature coefficient: nominal 0.2x
Specified Accuracy/°C@ 0°C -18°C or 28°C -40°C

→|← DIODE TESTER

Range	Test Current (Typical)	Open Circuit Voltage
9.999V	0.5mA	<3.5VDC

•)) AUDIBLE CONTINUITY TESTER

AM-52AM-53, AM-55, AM-56, AM-57, AM-59
Audible threshold: the beeper sounds if the measured resistance is lower than 10Ω, and turns off when greater than 200Ω. Response time <150µs

AM-50
Audible threshold: the beeper sounds if the measured voltage is lower than 30mV, and turns off when greater than 200mV. Response time <500ms

ACCESSORIES & REPLACEMENTS

AM-50 Series Holster	*H-50*	**0-1000A AC Current Transducer**	**A-664-4B**
AM-50 Series Test Leads	**MTL-90A**	*AC/DC TRMS 1000A Current Waveform Transducer*	*A-1000*
AM-55, 56, 57 & 59 Fuse 600V 15A (4A & 10A Ranges)	*KLK15*	**0-3000A AC Flexible Current Transducer**	**ACF-3000**
AM-52, 57, 59 uA mA Fuse .16A 250V	*5x20-216.160*	*AC/DC 600A Current Transducer*	*CT-600*
Instruction Manual	**977759**	**KW/Amp, 1000A, 200KW Transducer**	**AW-80**
9-Volt Battery	*MN1604*	*KW/Amp, 1000A, 400KW Transducer*	*AW-81*
Temperature Adaptor, Banana to K-type single thermocouple	**TAC-DMM**	**Infra Red DMM Probe**	**IR-100**
K-Bead Probe, (-50C to 800C) -58F to 1472	*TPK-56*	*Carrying Case*	*CC-ACDC*
0-400A AC Current Transducer	**A-400**		
0-300A AC Current Transducer	*A-663-4B*		

AM-71

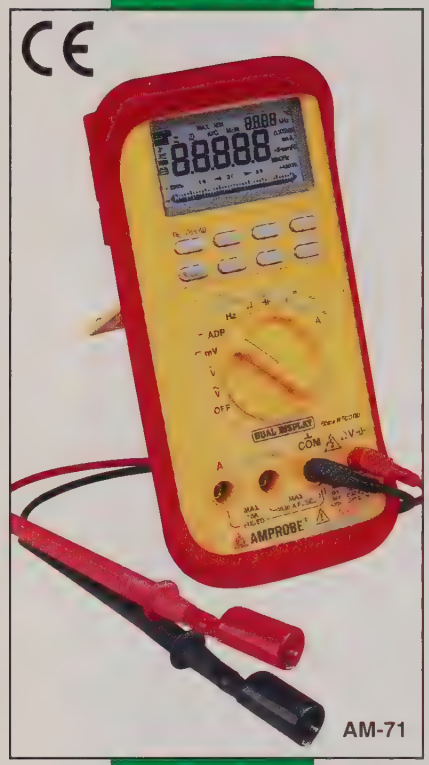
FEATURES

DCV Basic Accuracy, 0.2%, ACV Basic Accuracy 0.7%, DCA Basic Accuracy 0.4%, Ohms Basic Accuracy, 0.3%, nS Basic Accuracy, 0.7%

Frequency, 5 Ranges	Capacitance, 7 Ranges
DC Adaptor, 1 Range	AC Adaptor, 1 Range
Diode Test, 1 Range	Dual LCD Display
4,000 Counts	40,000 Counts
Analog Bargraph	50ms Record, Max, Min, Avg
Data Hold	Store & Recall
Relative Zero	Relative % Change
Relative Per Unit	Splash Proof Case
Protective Holster	Auto/Manual Ranging
Fused Protected	CE Certified

Designed to meet UL3111-1, CSA C22.2, No. 0101-1-92 and IEC 1010-1, EN61010-1

The AM-71 is supplied with a Heavy Duty Rubber Holster, Test Leads with Alligator Adaptor Clips, 9 Volt Alkaline battery



AM-71

SPECIFICATIONS

Display: 3-3/4 digits 4000 counts or 4-3/4 digits 40000 counts selectable (5 digits 99999 counts for Hz), and 4 digits 9999 counts dual display LCD
Polarity: Automatic
Update Rate: 3-3/4 Data: 5 per second nominal;
4-3/4 Data: 1.25 per second nominal;
41 segments Bargraph: 128 per second max
Low Battery: The indicator appears when the battery voltage drops below approx. 7.2V
Operating Temperature: 32° F (0°C) to 95°F (35°C), 0-80%RH; 95°F(35°C) to 122°F (50°C), 0-70% RH
Storage Temperature: -4°F (-20°C) to 140°F (60°C), 80%RH (with battery removed)
Temperature Coefficient: Nominal 0.15 x (specified accuracy)/°C @ (0°C -18°C or 28°C -50°C), °F@ (32°F -64°F or 82°F -122°F) or otherwise specified.
Power Supply: Single Alkaline 9V battery NEDA1604A, JIS6AM6, IEC6LF22
APO Timing: Idle for 4.5 minutes
APO Consumption: 20µA typical
Sensing: Average responding
Power Consumption: 9 mA typical
Weight: 1.1 lbs. (500gm) with Holster
Dimension: L7.32" (186mm) x W3.42" (87mm) x H1.39" (35.5mm) without holster
L7.79 (198mm) x W3.81")97mm) x 2.16" (55mm) with holster

Accuracy is ± (% Reading Digits + Number of Digits) or otherwise specified. At 23°C ±5°C (73°F ± 8°F) and less than 75% RH.

DC Voltage

RANGE	AM-71 ACCURACY
400.0mV, 4.000V, 40.00V, 400.0V	0.2%+1d
1000V	0.2%+2d

NMRR: >60DB @50/60HZ
CMRR: >120dB @DC, 50/60Hz, RG=1Kr
Input Impedance: 10mΩ, 30pF nominal for 400mV range)
Overload Protection: 780 Vrms/1000V peak (600VDC/VACrms for 400mV range)

AC Voltage

RANGE	AM-71 ACCURACY
50Hz —60Hz	
400.0mV, 4.000V, 40.00V, 400.0V, 750V	0.7%+3d
40Hz —500Hz	
400.0mV, 4.000V, 40.00V, 400.0V, 750V	1.0%+4d
500Hz—1KHz	
400.0mV	1.3%+4d
4.000V	2.5%+4d
40.00V, 400.0V, 750V	1.3%+4d
to 30KHz	
400.0mV	1.5dB typical
4.000V	Unspec'd
40.00V	3dB typical
400.0V	1.5dB typical
750V	1.5dB typical

CMRR: >60dB @ DC to 60Hz, Rg=KΩ
Input Impedance: 10MΩ, 30pF nominal (100pF nominal for 400mV range)
Overload Protection: 780 Vrms/1000Vpeak (600VDC/VACrms for 400mV range)

AM-71 (cont'd.)

AC Current

RANGE	AM-71	Burden Voltage
	ACCURACY	
50Hz —60Hz		
4000µA	1.0%+4d	0.15mV/µA
400.0mA	1.0%+4d	3.3mV/mA
10.00A*	1.0%+4d	0.03V/A
40Hz —300Hz		
4000µA	1.2%+4d	0.15mV/µA
400.0mA	1.2%+4d	3.3mV/mA
10.00A*	1.2%+4d	0.03V/A
300Hz —1Khz		
4000µA	1.5%+4d	0.15mV/µA
400.0mA	1.5%+4d	3.3mV/mA
10.00A*	1.5%+4d	0.03V/A

mA µA Overload Protection: 0.63A/500V Fuse, Interrupt Rating 200kA
A Overload Protection: 15A/600V Fuse, Interrupt Rating 100kA

*10A Continuous: 20A for 30 seconds maximum, 5 minutes cool down interval

Frequency

RANGE	AM-71
	ACCURACY
99.999Hz, 999.99Hz, 9.9999kHz, 99.999kHz, 250.00kHz	0.05%+4d

Sensitivity: 5Hz—100kHz*,>200mVrms, <20Vrms; 100kHz—250kHz <400mVrms, <20Vrms;

***Pulse Width** >3µs in this frequency range

Update Rate: ~1.9 per second nominal

Overload Protection: 600VDC/VAC rms

⊣⊢Diode Test

RANGE	Test Current (Typical)	Open Circuit Voltage
4.000V	0.8mA	<3.5VDC

Capacitance

RANGE	AM-71
	ACCURACY*
4.000nF**	4.0+10d
40.00nF	3.0%+5d
400.0nf	0.8%+5d
4.000µF	0.8%+3d
40.00µF***	4.0%+5d
400.0µF****	4.0+5d
4.000mF	3.5%+5d

*Accuracies with film capacitor or better
**Specified from 10% to 100% of range
***Add 30 counts below 25% of range
****Add 50 counts below 25% of range

DC Current

RANGE	AM-71	Burden Voltage
	ACCURACY	
400.0µA	0.4%+2d	0.15mV/µA
400.0mA	0.4%+3d	3.3mV/mA
10.00A*	0.6%+4d	0.03V/A

mA µA Overload Protection: 0.63A/500V Fuse, Interrupt Rating 200kA
Overload Protection: 15A/600V Fuse, Interrupt Rating 100kA

*10A Continuous: 20A for 30 seconds maximum, 5 minutes cool down interval

Frequency & ACV or AC ADP in Dual Display

RANGE	AM-71
	ACCURACY
99.99 Hz, 999.9Hz, 9.999kHz, 20.00KHz	0.01%+5d

Sensitivity: 5Hz—100Hz**, >15% F.S. of AC range;
100kHz—250kHz, >20% F.S. of AC range;
1kHz—10kHz, >40% F.S. of AC range;
10kHz—20kHz, >60% F.S. of AC range
*ACV750V range 5Hz—100Hz, >420VAC;
100Hz—1kHz, >550VAC;

****Pulse Width** >3µs in this frequency range
Update Rate: 1.3 per second nominal

Ohms:

RANGE	AM-71
	ACCURACY*
400.0Ω, 4.000kΩ, 40.00kΩ, 400.0kΩ	0.3%+2d
4.000MΩ	0.5%+2d
40.00MΩ	2%+5d
400.0nS	0.7%+5d

Overload Protection: 600VDC/VAC rms
Ohms Open Circuit Voltage: <1.3VDC (<3VDC for 400Ω range)
Overload Protection: 600VDC/VAC rms
•))Audible Continuity Tester: Audible threshold, the beeper sounds if the measured resistance is lower than 10Ω, and turns off when greater than 60Ω. Response time <150µs
Overload Protection: 600VDC/VAC rms
DC Adaptor: 10 counts per 1mVDC
Accuracy: Same as DC 400.0mV range
Input Impedance: 1000MΩ, 70pF nominal
Overload Protection: 600VDC/VAC rms
AC Adaptor: 10 counts per 1mVDC
Accuracy: Same as AC 400.0mV range
Input Impedance: 1000MΩ, 70pF nominal
Overload Protection: 600VDC/VAC rms
RECORD mode (MAX, MIN, MAX-MIN, AVE)
Nominal Response for DC: 50ms to 80%, 100ms to 995
Nominal Response for AC: 50ms to 80%, 100ms to 95%
Accuracy: Specified accuracy ±10 digits for changes>200ms in duration (±40 digits in AC): 1.5s autoranging buffer

ACCESSORIES & REPLACEMENTS

AM-71 Holster	H-70B	AC/DC 1000A Transducer	A-1000
AM-71 Case Gasket, Tilt Stand, Belt Clip.		0-3000A Flexible Transducer	ACF-3000
2 Upper & 2 Lower Case Screws	TSBC-71	KW/Amp, 1000A, 200KW Transducer	AW-80
AM-71 Test Leads	MTL-90	KW, Amp, 1000A, 400KW Transducer	AW-81
AM-71 500V/.63A Fuse	FA-6x32/.63	1 Red + 1 Black Alligator Adaptors	MTL-3
AM-71 600V/15A Fuse	KLK15	Carrying Case	CC-ACDC
9V Battery	MN-1604	Instruction Manual	977754
Infra Red DMM Probe	IR-100	Single Thermocuople Module	TMA-K
Temp. Accessory	TMA-1	Dual Thermocouple Module	PKT-2
0-400A AC Transducer	A-400	Relative Humidity Accessory	PRH-2
0-300A AC Transducer	A-663-4B	Carbon Monoxide Accessory	PCO-1
0-1000A AC Transducer	A-664-4B	Test Leads for PKT-2, PRH-2 and PCO-1	TL-10S
AC/DC600A Transducer	CT-600AC/DC		

AM-90 & AM-91

FEATURES

- 3 Year Warranty
- Closed unit software calibration

AM-91

The Ultimate Series™, Models AM-90 and AM-91 are hand held professional quality digital multimeters with benchtop features used for today's complex electrical and electronic system diagnostics and troubleshooting. The AM-91 offers DC+AC True RMS with a wide AC bandwidth for non-sinusoidal waveform measurements, as well as a Back Lighted LCD display for all light condition applications. The AM-90 is an Average sensing DMM RMS calibrated.

The measuring functions include DC Voltage, AC Voltage, DC+AC Voltage (AM-91), dBm (AM-91), Adaptor input, Frequency, Duty Cycle, Resistance, Conductance, Continuity Test, Capacitance, Diode Test, DC & AC Current. A dual display LCD so you can view 2 variables at the same time, ACV, Hz, ACA & Hz, ADP & Hz, nS & GΩ, Duty % & Hz.

Pushbutton functions include a 4000 count fast measuring mode, 40,000 count high resolutuion slow measuring mode, Data Hold, 41 segment bargraph that updates 128 times per second, Auto Polarity, Auto or Manual Ranging, Data Store & Recall, Relative Zero mode, Relative Percent Change mode. Relative Per Unit mode, 50ms Record Max/Min/Max-Min/Avg., 0.8ms Crest Max/Min/Max-Min., Sort™ Max/Min/Max-Min/Avg., dBm Reference Impedances Selection (AM-91) as well as Secondary Function Selection.

Power on options include Line Filter Frequency 50/60 Hz Selection for best noise rejection (normally only available on expensive bench top instruments), Auto Power off Disable, as well as a Beeper Disable.

The Ultimate Series™ is housed inside a gasket sealed heavy duty casing which keeps out grease, oil, dirt and moisture to maintain superb accuracy and reliability. The case is made of a high impact, thick wall fire retardant material to maximize durability of the meter, and safety to the user.

In addition, a sealed battery compartment design keeps battery leakage contaminants off the PC board, which largely reduces the potential risks of shortages and degrading of accuracy due the contaminants.

The Ultimate Series™ is designed and manufactured according to Protection Class II per the International Safety Standard IEC1010-1 installation category III, UL-3111-1, CSA 22.2 No. 1010-1-92 and CE standards, Contains NO CFC Ozone Depleting Substances, and are not manufactured with such substances.

The Ultimate Series™ from Amprobe are equipped with a heavy duty Rubber holster, Test Leads with Alligator adaptor clips, 9 volt battery and an Instruction Manual.

FUNCTION/FEATURE	AM-90	AM-91
4,000 COUNTS (FAST)	•	•
40,000 COUNTS (SLOW)	•	•
ANALOG BARGRAPH	•	•
DUAL DISPLAY	•	•
0.08% BASIC DCV ACC	•	•
BACKLIGHT DISPLAY		•
TRUE RMS CONVERSION		•
DC VOLTAGE, 6 RANGES	•	•
AC VOLTAGE, 5 RANGES	•	•
DC+AC VOLTAGE, 4 RANGES	•	•
DC CURRENT, 6 RANGES	•	•
AC CURRENT, 6 RANGES	•	•
RESISTANCE, 7 RANGES	•	•
CONDUCTANCE, 1 RANGE	•	•
FREQUENCY, 6 RANGES	•	•
DUTY CYCLE, 1 RANGE		•
CAPACITANCE, 7 RANGES	•	•
DC ADAPTOR, 1 RANGE	•	•
AC ADAPTOR, 1 RANGE	•	•
dbm & dB (20 REF), 1 RANGE		•
DIODE TEST, 1 RANGE	•	•
CONTINUITY, 1 RANGE	•	•
50ms RECORD	•	•
0.8ms CREST	•	•
SORT™	•	•
DATA HOLD	•	•
STORE & RECALL	•	•
RELATIVE ZERO	•	•
RELATIVE % CHANGE	•	•
RELATIVE PER UNIT	•	•
INPUT WARNING	•	•
PROTECTIVE HOLSTER	•	•
TOTAL RANGES	**48**	**54**

SPECIFICATIONS

Display: 3-3/4 digits 4000 counts or 4-3/4 digits 40000 counts selectable (5 digits 99999 counts for Hz) and 4 digits 9999 counts dual display LCD.

Polarity: Automatic

Update Rate: 3-3/4D Data 5 times/second nominal; 4-3/4D Data 1.25 times/ second nominal; 41 Segments Bargraph; 128 times/second max.

Low Battery: The indicator appears when the battery voltage drops below approx. 5.8V

Operating Temperature: 32°F (0°C) to 95°F (35°C), 0-80% R.H.; 95°F (35°C) to 122°F (50°C), 0-70% H.H.

Storage Temperature: -4°F (-20°C) to 140°F(60°C), 80% H.H. (with battery removed)

Temperature Coefficient: nominal 0.15 x (specified accuracy)/ °C @(0°C-18°C or 28°C-50°C), °F @(32°-F-64 °F or 82°F-122°F) or otherwise specified

Power Supply: Single Alkaline 9V battery, NEDA1604, JIS006P or IEC6F22

APO TIMING: Idle for 4.5 minutes

APO Consumption: 20µA

Dimension: L 7.32" (186mm) X W 3.42" (87mm) x H 1.39" (35.5mm) without holster; L 7.79" (198mm) x W 3.81" (97mm) x H 2.16" (55mm) with holster

Safety: Designed to UL 3111-1, CSA C22.2 NO.1010-1-92, and IEC1010-1 Installation category III

Overload Protection:
µA & mA: 0.63A/500V Fuse, FA6X32/.63;
A: 15A/600V Fuse, KLK 15;
V: 780Vrms, 1000Vpeak;
mV: 600VDC/VAC rms;
Others: 600VDC/VAC rms

Sensing: True RMS for AM-91; Average responding for AM-90

Power Consumption: 12 mA

Weight: 1.1 lbs. (500 gm) with holster

Accessories: Test leads (pair), holster, battery installed and user's manual

AM-90 & AM-91 (cont'd.)

ACCURACY IS ± (% READING DIGITS + NUMBER OF DIGITS) OR OTHERWISE SPECIFIED. AT 23°C ± 5°C (73°F ± 8°F) & LESS THAN 75% R.H.
***True RMS responding accuracies are specified from 5% to 100% of range or otherwise specified; Crest Factor <3:1 at full scale, and <6:1 at half scale**

RANGE	AM90	AM91
	Accuracy	
40.00 mV	0.5% + 6d	
400.0 mV, 4.000V, 40.00V, 400.0V, 1000V	0.08% + 1d	

DC Voltage
NMRR: >60dB @50/60Hz
CMRR: >120dB @DC, 50/60Hz, Rs=1kΩ
Input Impedance: 10MΩ, 30pF nominal (100pF nominal for 40mV & 400mV ranges)

AC Voltage

RANGE	AM90	AM91
	Accuracy	
50Hz — 60Hz		
400.0mV, 4.000V, 40.00V, 400.0V, 750V	0.5% + 3d	0.5% +3d
40Hz — 1kHz		
400.0mV	0.8% + 3d	0.8% + 3d
4.000V, 40.00V, 400.0V	0.8% + 4d	0.8% + 4d
750V	1.0% + 4d	1.0% + 4d
1kHz — 5kHz		
400.0mV	1.0% + 3d	1.0% + 3d
4.000V, 40.00V, 400.0V	10% + 6d	1.0% + 4d
750V	3.0%+8d**	3.0%+6d**
5kHz — 20kHz		
400.0mV	2.0%+6d**	1.5%+6d**
4.000V, 40.00V, 400.0V	1.8%+8d**	1.8%+6d**
750V	Unspec'd	Unspec'd
20kHz — 50kHz		
400.0mV	Unspec'd	2.5%+6d***

CMRR: >60dB @ DC to 60Hz, Rg=1kΩ
Input Impedance: 10MΩ, 30pF nominal (100pF nominal for 400mV range)
**Specified from 10% to 100% of range
***Add (30000/reading) counts below 38% of range

(AC + DC) Voltage

RANGE	AM91
	Accuracy
50Hz — 60Hz	
4.000V, 40.00V, 400.0V, 750	0.8% +8d
40Hz — 1kHz	
4.000V, 40.00V, 400.0V	1.0% + 8d
750V	1.2% + 8d
1kHz — 5kHz	
4.000V, 40.00V, 400.0V	1.2% + 8d
750V	3.2%+8d**
5kHz — 20kHz	
4.00V, 40.00V, 400.0V	2.0%+8d**
750V	Unspec'd

Input Impedance: 10MΩ, 30pF nominal
**Specified from 10% to 100% of range

Diode Test

Range	Accuracy	Test Current (Typical)	Open Circuit Voltage
4.000V	2%+1d	0.8mA	< 3.5 VDC

DC Current

RANGE	AM90	AM91	Burden Voltage
	Accuracy		
400.0µA	0.4% + 4d		0.15mV/µA
4000µA	0.2% + 2d		0.15mV/µA
40.00mA	0.4% + 4d		3.3mV/mA
400.0mA	0.2% + 3d		3.3mV/mA
4.000A	0.8% + 6d		0.03V/A
10.00A	0.4% + 4d		0.03V/A

AC Current

RANGE	AM90	AM91*	Burden Voltage
	Accuracy		
50Hz — 60Hz			
400.0µA	1.0% + 4d	1.0%+4d**	0.15mV/µA
4000µA	0.8% + 3d	0.8%+3d	0.15mV/µA
40.00mA	1.0% + 4d	1.0%+4d**	3.3mV/mA
400.0mA	0.8% + 3d	0.8%+3d	3.3mV/mA
4.000A	1.0% + 4d	1.0%+4d**	0.03V/A
10.00A	0.8% + 3d	0.8%+3d	0.03V/A
40Hz — 300Hz			
400.0µA	1.5% + 4d	1.5%+4d**	0.15mV/µA
4000µA	1.0% + 3d	1.0%+3d	0.15mV/µA
40.00mA	1.5% + 4d	1.5%+4d**	3.3mV/mA
400.0mA	1.0% + 3d	1.0%+3d	3.3mV/mA
4A	1.5% + 4d	1.5%+4d**	0.03V/A
10A	1.0% + 3d	1.0%+3d	0.03V/A
300Hz — 3kHz			
400.0µA	Unspec'd	Unspec'd	0.15mV/µA
4000µA	1.2% + 3d	1.2%+3d	0.15mV/µA
40.00mA	Unspec'd	Unspec'd	3.3mV/mA
400.0mA	1.2% + 3d	1.2%+3d	3.3mV/mA
4A	Unspec'd	Unspec'd	0.03V/A
10A	1.2% + 3d	1.2%+3d	0.03V/A

**Specified from 10% to 100% of range

Ohms

RANGE	AM90	AM91
	Accuracy	
40.00 Ω	0.2% + 6d	
400.0 Ω, 4.000kΩ 40.00kΩ, 400.0kΩ	0.15%+ 2d	
4.000MΩ	0.3% + 2d	
40.00MΩ	1.5% + 5d	
400.0nS	0.7% + 5d	

Open Circuit Voltage <1.3VDC

Frequency

RANGE	AM90	AM91
	Accuracy	
99.999Hz, 999.99Hz 9.9999kHz, 99.999kHz 999.99kHz, 4.0000MHz	0.002% + 3d	

Sensitivity: 5 Hz — 100kHz** >200mVms;
100kHz — 500kHz >400mVms;
500kHz — 2Mhz >850mVms;
2Mhz — 4Mhz >1Vms
**Pulse Width >3µs

Frequency & ACV or AC ADP in Dual Display

RANGE	AM90	AM91
	Accuracy	
99.99Hz, 999.9Hz 9.999kHz, 20.00kHz	0.002% + 1d	

Sensitivity**;
5Hz — 100Hz, >15% F.S. of AC range;
100Hz — 1kHz, >20% F.S. of AC range;
1kHz — 10kHz, >35% F.S. of AC range;
10kHz — 20kHz, > 50% F.S. of AC range;
**ACV750V range: 5Hz — 100Hz, >420VAC
100Hz—1kHz, >550VAC

Duty Cycle

RANGE	AM91
	Accuracy
0.1% — 99.9%	0.5d/kHz + 2d

Capacitance

RANGE	AM90	AM91
	Accuracy**	
4.000nF***	4.0% + 10d	
40.00nF	3.0% + 5d	
400.0nF	0.8% + 5d	
4.000µF	0.8% + 3d	
40.00µF	2.0% + 3d	
400.0µF	3.0% + 5d	
4.000mF	3.5% + 5d	

**Accuracies with film capacitor or better
***Specified from 10% to 100% of range

dBm (AM91 only)
Selectable reference impedance of 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000, 1200Ω
At 600Ω, -11.76dBm to 54.25dBm,
Accuracy: ±0.25dB + 2d (@40Hz—20kHz)
Input Impedance: 10MΩ, 30pF nominal

Audible Continuity Tester
Audible threshold: the beeper sounds if the measured resistance is lower than 10Ω, and turns off when greater than 60Ω. Response time <150µs.

DC Adaptor
10 counts per 1 mVDC
Accuracy: 0.08%+1d
Input Impedance: 1000MΩ, 70pF nominal

AC Adaptor
10 counts per 1 mVAC
Accuracy: Same as AC 400.0mV range
Input Impedance: 1000MΩ, 70pF nominal

ACCESSORIES AND REPLACEMENTS

AM-90/91 Holster	H-90Y
AM-90/91 Case Gasket, Tilt Stand, Belt Clip, 2 AM-90/91 case upper screws, 2 AM-90/91 case lower screws	TSBC-90
AM-90/91 Test Leads	MTL-90
AM-90/91 500V .63A Fuse	FA-6x32 .63
AM-90/91 600V/15A Fuse	KLK15
9V Battery	MN-1604
Differential Infrared DMM Probe	IR-100
Temp. Accessory	TMA-1
0-300A AC Transducer	A663-4B
0-1000A AC Transducer	A664-4B
AC DC 600A Transducer	CT-600 AC DC
AC DC 1000A Transducer	A-1000
0-3000A Flexible Transducer	ACF-3000
kW AMP 1000A, 200kW Transducer	AW-80
kW AMP 1000A, 400kW Transducer	AW-81
1 Red + 1 Black Alligator Adaptors	MTC-3
Instruction Book	P/N 977750
Carrying case	CC-ACDC

AM-1200

FEATURES

- High energy protection
- Over range indication
- 0.1 ohm resolution
- Auto zero on all ranges
- Easy to use single rotary switch for manual ranging
- Select ACV, DCV, ACA, DCA, resistance
- Color coded front panel
- Large, recessed 3 1/2" digit LCD display
- Low battery indicator
- Reversed polarity indicator
- Expandable to measure temperature, 15K VAC/VDC, 6000Amp AC, power, with accessories.
- Rugged high impact molded case
- Includes holster, test leads, 9 volt battery and instruction manual.

AM-1200

SPECIFICATIONS

Voltage Ranges: 0-1999mV/199.9/750 VAC
0-1999mV/19.99/199.9/1000VDC

Resistance Ranges: 0-199.9/1999 Ohms
0-19.99/199.9K/1999K Ohms

Current Ranges: 0-1999µA DC
0-19.99/199.9/1999mA DC
0-10 Amps DC
0-19.99/199.9/1999mA AC
0-10 Amps AC

NOTE: AC Accuracy may be affected by outside interference.

Accuracy: DCV: ±0.5% of rdg ± 2 LSD
ACV: ±1.5% of rdg ±2 LSD
DC Amps: All ranges ±1.0% of rdg ±2 LSD except 10 Amp range, which is ±1.5% of rdg ±3 LSD
AC Amps: All ranges ±1.5% of rdg ±2 LSD except 0 Amp range, which is ±2.0% of rdg ±3 LSD

Ohms: All ranges ±0.75% of rdg ±2 LSD except 2 megohm range, which is ±1% of rdg ±2 LSD.
15 KV AC/DC high voltage probe: add up to ±2% of rdg.

The AM-1200 features auto-zeroing on all ranges.

Input Impedance: 10 Megohms.

Circuit Protection: Microamp (µA) and milliamp (mA) ranges are fuse protected up to 600 Volts AC/DC maximum. Do not use substitute fuse. 10 Amp range is not fused.

All resistance ranges are overload protected against momentary mis-application of up to a maximum of 500V AC/DC for no longer than ten seconds.

The 10 ampere range is overload protected up to 20 amperes for 30 seconds maximum. All voltage ranges are overload protected up to 800V AC and 1100V DC.

Display: 3-1/2 digits LCD

Digit Size: 5/8" (1.59cm)

Power Supply: 9 Volts

Battery Life: 175 hours minimum

Operating Temperature/Relative Humidity: 32° to 120° F (0° to 48.8°C), 80% RH

Storage Temperature/Relative Humidity: 0° to 140°F (20° to 60°C), 80% RH with battery removed

Case Voltage Breakdown: 3000 VAC

Sampling Rate: 2.5 times/sec.

Response Time: 3 seconds

Size: 6-3/8" (16.19cm) x 3" (7.62cm) x 1 1/4" (3.17cm)

Weight: 8.5 oz (240 gm)

ACCESSORIES AND REPLACEMENTS

Test Leads	MTL-1200
Fuse	6.3x25-2-12
Holster	H1200Y
Battery (9V)	MN1604
Instruction Book	P/N 967750

AM-1250 & AM-1260

FEATURES

- **Multi-Sensing™*** allows the user to select: **True RMS** (AC True RMS) for loads with distorted wave forms. Average (AC AverageSensing Scaled to RMS) for use on linear, undistorted loads. Make comparative evaluations of systems suspected of having **Harmonic Distortion** (Model 1260)
- Select ACV, ACA, DCV, DCA , resistance, diode test, audible continuity test
- 3 1/2 Digit, 2000 count LCD display
- Low battery indicator
- Reverse Polarity Indicator
- mA and 10A inputs are fuse protected
- Color coded front panel with rotary switch
- Auto zero on all ranges
- Expandable to measure temperature 15K VDC, 0-1000 amps, power and leakage current with optional accessories
- Includes battery, test leads, tilt stand and instruction manual
- Rugged high impact molded case
- Optional-soft vinyl case (SV-1)
- True RMS AC meter (Model 1250)

*Multi mode measuring system - U.S. Patent No. 5, 144, 226

AM-1250

AM-1260

SPECIFICATIONS

Voltage Ranges: 0-1.999/19.99/199.9/750 VAC (True RMS or Average)
0-1.999/19.99/199.9/1000 VDC
0-199.9 mVDC/mVAC

Resistance Ranges: 0-199.9 ohms
0-199.9 ohms with continuity buzzer
0-1.999/19.99/199.9 KΩ
0-1.999/19.99 MΩ

Special Diode Check Function 2mA @ 1.999 VDC

Current Ranges: 0-1.999/19/99/199.9/1999mA AC/DC 0-10 amps AC/DC

Accuracy: DC (volts, millivolts, and milliamps ranges): ±0.8% of reading ±1 LSD

AC TRMS (volts, millivolts, and milliamps ranges) sine waves: ±1.5% of reading ±1 LSD sine waves 40Hz to 5kHz.

AC TRMS volts or millivolts, distorted waves: ±1.5% of reading ±3 LSD, valid for waveforms with crest factor ≤3, 40 Hz to 2kHz, with harmonics up to 20kHz.

AC TRMS milliamps, distorted waves: ±1.5% of reading ±3 LSD, valid for waveforms with crest factor ≤ 3, 40Hz to 2kHz, with harmonics up to 10kHz.

AC AVG (volts, millivolts, and milliamps ranges: AM-1260 only): ±1.5% of reading ±1 LSD sine waves 40 Hz to 2kHz. ±1.5% of reading ±4 LSD sine waves 2kHz to 5kHz.

10 Amps AC/DC: As per the above specs for the DC, AC TRMS and AC Avg modes, plus additional error of ±1% of reading ±2 LSD. AC sine wave readings (TRMS and AVG) valid for 40Hz to 3kHz. Distorted waveform RMS readings valid for waveforms with crest factor ≤3, 40 Hz to 1kHz, with harmonics up to 5kHz.

All AC specs are valid only from 5% to 100% of range.

All ohms ranges: ±1% of reading ±2 LSD.

Temperature coefficient of ohms ranges: ±0.01% of reading/°C max.

Temperature coefficient of volts and amps ranges: ±0.05% of reading/°C max.

Case Voltage Breakdown: 3000VAC.

Operating Temperature/Relative Humidity: +32°F to 120°F (0°C to +50°C); 80% RH.

Storage Temperature/Relative Humidity: +14°F to 131°F (-10°C to +55°C); 80% RH.

Size: 6.3"H x 3"W x 1.28"D (16cm H x 7.62cm H x 3.25cm D).

Weight: 9.0 oz. (255 gm) without test leads.

Circuit protection: The milliamp ranges are fuse protected up to 600 volts AC/DC with a 2 amp fuse, Cat. No. 6.3x25-2-12. The 10A range is protected up to 600 volts AC/DC with a 10 amp fuse, Cat. No. 6.3x25-10-12. Do not use substitute fuses.
All voltage ranges, except the 200mV range, are overload protected for up to 800 VAC and 1100 VDC. The 200mV range and all resistance ranges are protected against momentary misapplication of up to a maximum of 500V AC/DC for no longer than 10 seconds.

Over-range Indication: "1" at lift side of display.

Input Impedance: 10MΩ

Digit Sizes: 5/8" (1.59 cm)

Response time: Not more than 2.5 seconds.

Sampling rate: Approximately 2.5 times/second.

Power supply: One 9V alkaline battery, Model MN-1604.

Battery life: More than 200 hours.

Low-battery indication: "🔋" in bottom left corner of display.

ACCESSORIES AND REPLACEMENTS

Test Leads	MTL-1200
Fuse	6.3 x 25-2-12
Fuse (10 amp)	6.3 x 25-10-12z
Holster	H-1200Y
Battery	MN-1604
Instruction Book^	P/N 966750

AM-1280

AM-1280

FEATURES

- 3 3/4" Digit (4000 Count) 11/16" LCD digit display
- Over range indication
- Data hold, maximum/minimum hold, relative mode; data store and recall
- Autorange/manual range selectable for DCV/ACV, capacitance, frequency and resistance
- Auto-power off/low power consumption (Auto Power Off can be disabled)
- Measures DCV, ACV, DCA, ACA, resistance, capacitance, frequency, diode check, audible continuity and an adaptor input to expand meter capabilities by giving a very accurate 10 count/1m VDC of input
- Color coded front panel with rotary switch
- 42 segment analog bargraph indication
- Reversed polarity indication "(-)"
- Low battery indication
- Input alarm warning detects wrong input jack connections
- UL94V-0 plastic case, removable tilt stand, complete with test leads, rubber holster for rugged use, battery and operation guide
- Auto zeroes on all ranges
- Accessories add power, leakage, high current (6000 amps), temperature and 15KV AC/DC testing capability
- mA and 10A inputs are fused protected

SPECIFICATIONS

Voltage Ranges: (Autorange)
0-3.999/39.99/399.9/750 VAC, 399.9mVAC (manually selected)
0-3.999/39.99/3999.9/1000 VDC, 399.9mVDC
Resolution: 0.1 mV - 1V
Resistance Ranges: (Autorange)
0-399.9 ohms
0-399.9 ohms with buzzer
0-3.999/39.99/399.9 K ohms
0-3.999/39.99 M ohms
Special Diode Check Function: Test voltage 2.2 to 3.3 V, 1mv resolution, ±1.0% of rdg. ±3 LSD
Test current, approximately 0.8 mA
Current Ranges: (Manual)
0-3.999/39.99/399.9 mA AC/DC
0-10A AC/DC
Capacitance Ranges: (Autorange)
0-3999/39.99/399.9/nF
0-3.999/39.99 µF
Frequency Ranges: (Autorange)
0-99.99 Hz
0-.9999/9.999/99.99 KHz
0-.9999 MHz
Accuracy: DCV: ±0.3% of rdg, ±2 LSD, input impedance on 400 mV range = 100 MΩ, 10 MΩ on 4V - 1000V range
DCA: ±1.0% of rdg, ±2 LSD, 10A range = ±1.5% of rdg, ±3 LSD
ACV: 400 mV; 50 Hz-60 Hz, ±(1.0% of rdg + 5 LSD) 60Hz-100 Hz, (1.5% of rdg + 5 LSD)
4V/40V/400V/750V; 50-500 Hz, ±(1.0% of rdg + 5 LSD) 4V/40V/400V/750V;
500 Hz-1KHz, ±(1.5% of rdg + 5 LSD)
DCA: 4mA, 40mA, 400mA; ±(1.0% of rdg ±2 LSD 10A; ±(1.5% of rdg ±3 LSD)
ACA: 4mA, 40mA, 400mA, 10A, 40 to 1KHz ±(1.2% of rdg ±5 LSD)
Diode: ±(1.0% of rdg ± 4 LSD)
Capacitance Ranges: 4 nF/40nF/400nF/4uF; ±(1% of rdg ± 4 LSD) 40µF ±(5% of rdg ±5 LSD)
Adaptor Input: For millivolt sources (1000 MΩ input impedance)@ 10 counts for 1 mV DC ±
(0.5% rdg + 3 LSD)
Ohms Ranges: 400Ω, 4MΩ ±(1.0% of rdg ± 4 LSD), 4K, 40K, 400KΩ ±(0.7% of rdg ± 2 LSD) 40MΩ
±(2.0% of rdg ± 3 LSD)
Frequency Ranges: 100 Hz, 1 KHz, 10KHz, 100 KHz, 1 MHz ±(0.1% of rdg ± 4 LSD)
Sensitivity: (40 mV RMS for 100 Hz, 1 KHz, 10 KHz) (400 mV RMS for 100 KHz, 1 MHz)
Input Impedance: 10 Megohms
Response Time: Not more than 3.5 seconds
Display Update Rate: Digital, 2X per second; Bargraph, 20X per second
Power Supply: 2 AA batteries included
Battery Life: Approximately 1200 hours
Auto Shut-off: 30 minutes after last mode or function change (Can be disabled)
Operating Temperature: 32°F (-0°C) to 122°F(50°C)
Storage Temperature/Humidity: 14°F(-10C) to 131°F (55°C) 80% RH
Size with Holster: 7.00" (17.78cm) x 3.375" (8.57cm) x 1.562" (3.96cm)
Weight with Holster: 12.4 oz (0.35 Kg)
Case Breakdown Voltage: 3000 VAC
Over-range Indication: Blinking in the MSD (most significant digit)
Circuit Protection: All milliamp ranges 600 volt fast blow fuse, capacitance, ohms, frequency, diode check, continuity buzzer and ADP-overload protected to 550 VAC for up to 15 seconds; 10 AMP range is fused.

ACCESSORIES AND REPLACEMENTS

Test Leads	MTL-1200
2 Amp Fuse	6.3 x 25 - 2 - 12
10 Amp Fuse	6.3 x 25 - 10 - 12
1.5V AA Batteries (2)	S915(2)
Rubber Holster	H-1200Y
Instruction Book	P/N 967754

PMM-1, PMM-C & A-400

FEATURES PMM-1

- 600V AC/DC protection on all ranges
- Conforms to UL3111-1, IEC 1010 Pt. 1, Class 11, and CSA standards
- 3200 count annunciated LCD display
- 65 segment analog bargraph
- Auto/Manual ranging
- 0.7% DCV accuracy
- 1.7% ACV accuracy
- 1.0% ohms accuracy
- Fast, audible continuity test
- Data hold
- Auto power off (10 min)
- Test leads, SV-12 carry case, manual and 2 "AAA" batteries included

PMM-1

SPECIFICATIONS

Accuracy is + or - (% reading + number of digits) at 23 Degree C +/- 5 degree C, less than 75% R.H.

DC VOLTAGE
Range: 320 mV TO 600V **Accuracy:** +/-(0.7% + 2 dgt)
Input Impedance: 10 Meg Ohms

AC VOLTAGE
Range: 3.2 V TO 600V **Accuracy:** +/-(1.7% + 5 dgt)
Input Impedance: 10M ohms/less than 100pF
Frequency Response: 40-300Hz (≤3.2V); 50-60Hz (3.2V-32V); 40-500Hz (32V-600V)

RESISTANCE
Range: 300Ω TO 30MΩ **Accuracy:** +/- (1.2% rdg + 4 dgt)
Open Circuit Voltage: 1.3V Approximate

DIODE CHECK AND CONTINUITY
Resolution: 1mV
Max Test Current: 1.5mA
Max. Open Circuit Voltage: 3.3V
Accuracy: +/- (1.5% rdg + 5 dgt)
Overload Protection: 600V DC/AC rms max
Continuity: Built-in buzzer sounds when resistance is less than 20 ohms
Maximum Altitude: 2000 meters
Installation Category: To level III protected against transients to 6KV
Pollution Degree: Level III
Operating Temperature: 32° to 122°F (0° to 50°C), 0 to 80% R.H.
Storage Temperature: -4° to 140°F (-20° to 60°C), 0 to 80% R.H. when battery is removed from the meter
Temperature Coefficient: 0.15 x (Spec. Acc'y)/Degree °F, <64°F or >82°F
Power Requirements: IEC LR03, AM4 or AAA size 1.5V x 2
Battery Life: Alkaline 800 hours
Dimensions: 1.65" (W) x 5.71" (H) x 0.95" (D); 42 mm (W) x 145 mm (H) x 24 mm (D)
Weight: 4.2 oz. (120 grams), without probes
Accessories supplied: Listed under "Accessories and Replacements"

FEATURES A-400

- 400 Amp AC capability
- 1.9% basic accuracy
- Accommodates conductors 1.14" in diameter
- Coiled cable
- Hand Guard design
- Carrying case and manual included
- Works with DMM's and PMM-1

A-400

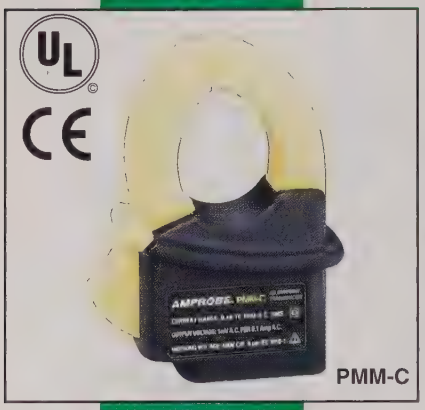
SPECIFICATIONS

Range: 0.1A to 400A AC RMS
Output Voltage: 1mV AC per 1 AMP AC
Working Voltage: 600V Cat II per IEC 1010-1
Maximum Altitude: 2000 meters
Operating Temperature: 32° to 113°F <75% R.H.
Storage Temperature: -20 degree C to 60 Degree C
Temperature Coefficient: 0.2 x (Spec. Acc'y/Degree C, <18 Degree C or >28 degree C
Maximum Output Impedance: 75 Ohms
Max. Jaw Opening: 30mm, 1.18"
Max. Conductor Size: 29mm, 1.14" diameter
Frequency Response: 50/60Hz
Size: 72mm (W) x 148mm (L) x 36mm (D), 2.83" (W), 5.83" (L), 1.42" (D) W/O cable
Weight: 250 grams
Accuracy is +/- (% reading + number of Amps) at 23 degree C (73°F) +/- 5 degree C (10°F), less than 75% R.H. Accuracy to 350 amps is +/- (1.6% + 0.5A) 50 - 60 Hz. Accuracy at 400 Amps, +/- (3.2% + 1A) 50-60 Hz

ACCESSORIES AND REPLACEMENTS

PMM-1 Carrying Case	SV-12	Standard Black Test Lead	PMTL-4
Short Red Test Lead 2 Pc.	PMTL-1	AAA Battery	912
Long Red Test Lead	PMTL-2	Instruction Book	P/N 973754
Black Alligator Clip	PMTL-3		

PMM ACCESSORIES



PMM-C

FEATURES - PMM-C CLAMP-ON TRANSDUCER

- 300 AMP AC capability
- 1.9% Basic Accuracy
- Accommodates conductors 1.14" diameter (29mm)
- Hand guard design
- Inserts into PMM-1 input terminals

SPECIFICATIONS

Range: 0.4A to 300 Amps AC RMS
Output Voltage: 1mV AC per 0.1 AMP AC Ex: 4 AMPS AC, output reading is 0.040V
Operating Temperature: 32°F to 113°F<75% R.H.
Temperature Coefficient: 0.15x (spec. acc'y)/Degree °F<64°F or >82°F
Max. Output Impedance: 120 OHMS
Size: 2.83" (W) x 4.02" (L) x 1.42" (D); 72mm (W) x 102mm (L) x 36mm (D)
Weight: 5.3 oz (150g)
Accuracy: +/- (1.9%+0.5A) 50-60Hz
Max. Jaw Opening: 1.18" (30mm max)

PKT-2

FEATURES - PKT-2 DUAL K-TYPE THERMOCOUPLE CONVERTER

- Converts any DMM into a thermometer
- -58°F to 1832°F range
- Standard 9V battery
- Power indicator: flashing LED

SPECIFICATIONS

(All at 73°F ±9°F <80% R.H.)
Conversion Factor: 1 mV DC per; °F
Output Impedance: 10K Ω
Accuracy: (T_1, T_2)
±(2.0% + 4°F) for -58°F to -10°F
±(0.5% + 4°F) for -9°F to 662°F
±(2.0% + 4°F) for 663°F to 932°F
±(2.9% + 4°F) for 933°F to 1832°F
(T_1, T_2)
±(5.8% + 8°F)
Operating Temperature: 32°F~95°F (≤90% RH); 95°F~122°F (≤70%RH)
Storage Temperature: -4°F~140°F
Temperature Coefficient: 0.15 x (Spec. Accuracy) /°F, <64°F, >82°F
Safety: Designed to meet EMI: EN55022 EMS: IEC801-2~IEC801-3
Power Requirements: Standard 9V Battery, NEDA 1604 JIS 006P IEC 6F22
AMPROBE Model MN1604
Battery Life: 250 hrs. typical (ALKALINE)
Dimensions: 3.86"(L) x 2.60"(W) x 1.18"(D); 98mm(L) x 66mm(W) x 30mm(D)
Weight: 4.6 oz. (130g)
K-Type Thermocouples sold separately

PCAP-2

FEATURES - PCAP-2 uF/CAPACITANCE CONVERTER

- Converts any DMM into a capacitance meter
- 1µF to 3000µF range
- Standard 9V battery
- Power indicator: Flashing LED

SPECIFICATIONS

(All at 23°C ±5°C <80%R.H.)
Conversion Factor: 1mV DC per 1µF
Output Impedance: 10KΩ
Maximum Input Voltage: 600V DC or AC rms
Accuracy: ±(2%+2µF) for 1µF to 420µF; ±(3%+20µF) for 421µF to 3000µF
Operating Temperature: 0°C~30°C (≤80%RH); 30°C~40°C (≤75%RH), 40°C ~50°C (≤45%RH)
Storage Temperature: -20~60°C
Temperature Coefficient: 0.15x(Spec. Accuracy)/°C, <18°C, >28°C
Safety: Designed to meet IEC1010-1 EMI: EN55022
EMS: IEC801-2 ~ IEC801-3
Power Requirements: 9V Battery, AMPROBE Model MN1604
NEDA 1604 JIS 006P IEC 6F22
Battery Life: 80 hrs typical (ALKALINE)
Dimensions: 3.86"(L) x 2.60"(W) x 1.18"(D); 98mm(L) x 66mm(W) x 30mm(D)
Weight: 6.6 oz. (187g)

PMM ACCESSORIES

FEATURES - PRH-2 RELATIVE HUMIDITY TRANSDUCER

- Converts any DMM into a relative humidity meter
- 10%~95% range
- Polymer type sensor
- Standard 9V battery
- Power indicator: Flashing LED

Versatility in the Palm of Your Hand

PRH-2

SPECIFICATIONS

(All at 23°C ±5°C)
Conversion Factor: 1 mV DC per 1%RH
Accuracy: 10%RH~20%RH, ±7%RH
20%RH~35%RH, ±5%RH
35%RH~75%RH, ±3%RH
75%RH~90%RH, ±5%RH
90%RH~95%RH, ±7%RH
Operating Temperature: 5°C~45°F (10% RH~95%RH)
Storage Temperature: -20°C~60°C (0~50%RH)
Temperature Coefficient: 0.2 x (Spec. Accuracy) per °C, <18°C, >28°C
Safety: Designed to meet EMI: EN55022 EMS: IEC801-2~IEC801-3
Power Requirements: 9V Battery, AMPROBE Model MN1604 NEDA 1604 JIS 006P, IEC 6F22
Battery Life: Alkaline 300 hours
Dimensions: 5.04"(L) x 2.60"(W) x 1.18"(D); 128mm(L)66mm(W)28mm(D)
Weight: 4.6 oz. (130g)

FEATURES - PAMP-2 MICROAMP CONVERTER

- Converts any DMM into a microamp current meter
- -3000 µA DC to +3000 µADC range
- No battery needed

PAMP-2

SPECIFICATIONS

(All at 23°C ±5°C <80%R.H.)
Conversion Factor: 1mV de per 1µ A DC
Output Impedance: 1.6 KΩ
Accuracy: ±(2%+0.1µA) 420.0 µA
±(2%+1µA) 3000 µA
Operating Temperature: 0°C~30°C (≤80%RH); 30°C~40°C (≤75%RH), 40°C~50°C (≤45RH)
Storage Temperature: -20~60°C
Temperature Coefficient: 0.15x(Spec. Accuracy)/°C, <18°C, >28°C
Safety: Designed to meet IEC1010-1 EMI: EN55022
EMS: IEC801-2 ~ IEC801-3
Power Requirements: 9V Battery, AMPROBE Model MN1604
NEDA 1604, JIS 006P, IEC 6F22
Circuit Protection: Protected for misapplication up to 250VAC RMS for 1 min. by internal PTC.
Dimensions: 3.86"(L) x 2.60"(W) x 1.18"(D); 98mm(L) x 66mm(W) x 30mm(D)
Weight: 3.6 oz. (100g)

FEATURES - PCO-1 CARBON MOXIDE TRANSDUCER

- Converts any DMM into a carbon monoxide detector
- 0ppm to 1000ppm range
- 0.1 ppm resolution for 400.0mV range of meter
- Standard 9V battery
- Power indicator: Flashing LED

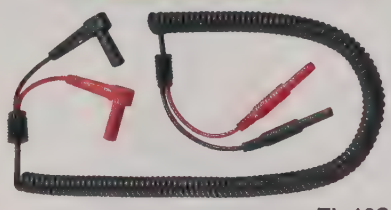
PCO-1

SPECIFICATIONS

(All at 23°C ±5°C <75%RH)
Conversion rate: 1mV DC per 1 ppm
Output Impedance: 2KΩ
Accuracy: ±(5% +5 ppm)
Operating Temperature: 32°F to 104°F (0°C~40°C) 0 to 80% RH
Storage Temperature: -4°F to 140°F (-20°C~60°C) 0 to 80% RH
Temperature Coefficient: 0.15 x (Spec. Accuracy) per °C, <18°C, >28°C
0.1 x (Spec Accuracy)/°F <64°F,>140°F
Relative Humidity: 0% to 80%
Safety: Designed to meet EMI: EN55022 EMS: IEC801-2~IEC801-4
Power Requirements: 9V Battery, NEDA 1604, JIS 006P, IEC 6F22
AMPROBE Model MN1604
Battery Life: 1500 hours
Dimensions: 4.80"(L) x 2.60"(W) x 1.10"(D); 122mm(L) 66mm(W) 28mm(D)

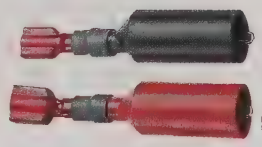
PMM TEST LEADS, ACL-4B, 14 & 1280

ACCESSORY HEAD TEST LEADS

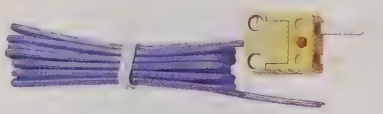


TL-10S

PFCP-1



PAC-1



TPK-56

Model TL-10S
Accessory Head Test Leads

Allows the accessory head to become remote from the PMM for hard to reach applications. Also enables any PMM accessory head to interface to a digital multimeter that accepts a standard shrouded banana test lead.

PAMP-2 ACCESSORIES
Model PFCP-1

1/8" (3mm) Flame current test jack plug
Slides onto PAMP-2 test leads and allows meter to be quickly connected in series enabling flame current measurements on systems that provide a current test jack.

Model PAC-1
Alligator Clips

Slides onto PAMP-2 test leads and allows meter to be quickly connected in series enabling flame current measurements on systems that provide current test points.

PKT-2 ACCESSORY
Model TPK-56

Bead K-Type Thermocouple
Temperature Range: -58°F to 400°F
(-50°C to 204°C)

PMM-Kit

PMM-KIT

PMM-KIT: contains PMM-1, PKT-2, PCO-1, PMM-C, PCAP-2, PRH-2, PAMP-2, PMTL-1, PMTL-2, PMTL-3, PMTL-4, TL-10S, PFCP-1, PAC-1, 2 pcs. of TPK-56, and CC-PMM case

CDM-1

FEATURES

CREDIT CARD SIZE DIGITAL MULTIMETER

- Auto-ranging for ACV, DCV and Ohms
- Convenient carrying case with test lead storage
- Auto power OFF
- 32 Segment Analog Bargraph
- Data Hold
- Audible Continuity Check
- Diode Check
- Single knob function and range selector switch for easy one hand operation
- 3-3/4 digit, 3200 count annunciated LCD display
- Low battery indicator

CDM-1

SPECIFICATIONS

DC Voltage:
Ranges: 320mV, 3.2V, 32V, 320V, 450V
Accuracy:

320mV	±1.3% of reading and ±2 digits
3.2V	±0.7% of reading and ±2 digits
32, 320, 450V	±1.3% of reading and ±2 digits

(Maximum measurement = 450V)

AC Voltage:
Ranges: 3.2V, 32V, 320V, 450V
Accuracy on all Ranges is ±2.3% of reading ±5 digits
(Maximum measurement = 450V RMS)

Resistance:
Range: 320Ω, 3.2KΩ, 32KΩ, 320KΩ, 3.2MΩ, 3.2MΩ
Accuracy:

320Ω	±2.0% of reading, ±4 digit
3.2-32-320KΩ	±2.0% of reading, ±2 digit
3.2MΩ	±6.0% of reading, ±2 digit
32MΩ	±10.0% of reading, ±5 digit

Input Impedance: 10MΩ (DCV/ACV), greater than 1000MΩ on 320mV DC

Display: 3-3/4 digit LCD, Sampling Rate 2 times/sec.

Bargraph: 32 Segment Analog, Sampling Rate 12 times/sec.

Overload Protection: 450V DC/AC rms for 10 sec. Max.

Operating Temperature: 32°F to 104°F (0 to 40°C) @80% RH

Storage Temperature: -4°F to 140°F (-20 to 60°C) @80% RH

Auto Power OFF: Shut off time 10 minutes

Polarity Indication: Yes

Power Source: 2 x LR-44 or 357 Cells

Battery Life: Over 70 Hours

Power Consumption: 5mW (Typical)

Dimensions: 2.1"W x 4.3"H x 0.5"D (54mm W x 108mm H x 12mm D)

Weight: 3.5 oz. (100 g) (including batteries and case)

AW-80 & AW-81

FEATURES

KILOWATT/AMPERE TRANSDUCERS - AW-80 & AW-81

USA

AW-80

- Measures Kilowatts
- Measures Amperes AC
- Determine KVA and Power Factor

The AW-80/AW-81 transducers may be used with any digital multimeter that has ranges of 0-2 and 0-20 VAC/DC or similar ranges, a 10 megohm input impedance, and that will accept standard banana plug test leads.

SPECIFICATIONS

AW-80 Ranges: 0- 1000 amps AC (50-60Hz); 0-20/200KW (single phase) with voltage input of up to 240 VAC (+10 maximum) and current input of 0-150A/1000A (50-60Hz).

AW-80 Output: 20KW (150A) Range
100 mVDC/KW
200KW (1000A) Range
10 mVDC/KW

AW-81 Output: 40KW (150A) Range
10 mVDC/KW
400KW(1000A) Range
1 mVDC/KW

AW-80/81 AC Amps Output: 1mVAC/AMP
Accuracy: KW, ±2.8% of reading, amps, ±2% of reading based on sinusoidal waveform.
Circuit Protection: Overload protected to 2000 amps AC and 400 volts AC (AW-80); 600 volts AC (AW-81).
Operating Temperature/Humidity: +32°F to 104°F (0°C to +40°C) RH 80%
Battery Life: Based on test cycle of 10 seconds "on" and 20 second "off" – 25 hours or 3000 cycles. Based on test cycle of 20 seconds "on" and one minute "off" –33 hours or 1500 cycles.
Jaw Capacity: 2" (50.8mm) Dia. or 2000MCM
Case Voltage Breakdown: 3000VAC
Size: 8 15/16" h x 2 5/8" w x 1 19/32" d (22.7 cm x 6.7 cm x 4.1 cm)
Instrument Weight: 15 oz (425 gm)
Carrying Case: SVPC
Supplied with VL-80 Test Leads and AE carrying case

Note: Also see KW/KVAR recorder Models LAW78KWH(T), LAW79KWH(T) and Power Factor/Volt/Ammeter Models PF1000 and PF1050.

KW/AMPERE TRANSDUCERS RECORDING MODULE

USA

LAW-82

When it becomes necessary to monitor the power being consumed or a current load over a period of time, an AW-80/AW-81 may be used with an accessory recording module model LAW-82 or LAW82T (Take-up Reel Model) to record the power (KW) up to 400 KW or current up to 800 amperes.

SPECIFICATIONS

Ranges: AW-80 with LAW82 or LAW-82T:
0-10/20/100/200 KW
0-800 amps AC (50-60Hz)
AW-81 with LAW82 or LAW-82T:
0-20/40/200/400KW
0-800 amps AC (50-60Hz)

Size: LAW-82:
6 7/8"h (17.5cm) x 5 7/16" w (13.8cm) x 3 15/16"d (3.9cm)
LAW-82T: 8 3/4" h (22.2cm) x 10 5/8"w (27cm) x 8 7/8"d (22.5cm)

Accuracy: KW±3%FS, Amps ±3%FS based on sinusoidal waveform.

Circuit Protection: Overload protected to 2000 amps and 400 volts (AW-80); 600volts (AW-81)

Strip Chart: P/N 840W82 (30 ft. long) for Model LAW-82 or LAW-82T. P/N 840W82-6 (60 ft. long) for Model LAW-82T

Power Supply: 120VAC 60Hz will be supplied unless otherwise specified.

Supplied with one roll of 30 foot strip chart paper.

Instruction Book: P/N 981759

A663-4B, A664-4B & ACF-3000

FEATURES

CURRENT TRANSDUCERS - A663-4B & A664-4B

Clamp on AC current transducers that can be used with digital multimeters that have 200.0mV, 2.000V, or similar ACV ranges.

SPECIFICATIONS

Current Range: 0-300 Amps (A663-4B), 0-1000 Amp (A664-4B)
Sinusoidal Waveform Output: 1mVAC/Amp
Sinusoidal Waveform Output Accuracy: ±1% of reading plus accuracy of measuring instrument
Frequency: 50 to 400 Hz (harmonics to 2KHz)
Minimum Input Impedance of Measuring Instrument: 10K ohms
Breakdown Voltage (between secondary and core): 1500 volts RMS
Case Breakdown Voltage (between laminations and case): 3000 volts RMS
Cord Length: 5 ft.
Termination: Banana plugs
Accessories: A-47L ENERGIZER "splits" double conductor line cords. Multiplies current measuring sensitivity by 10x.

FEATURES

3000 AMP AC FLEXIBLE CURRENT TRANSDUCER - ACF-3000

- Ruggedly designed yet lightweight and flexible to install around conductors with limited access or where traditional current clamp-on transducers cannot gain access.
- Two switchable AC Current ranges 300/3000 Amps RMS with respective outputs of 1mV per Amp (300 A range) & 0.1 mV per Amp (3000 A range).
- Compatible with most multimeters, chart recorders, dataloggers, oscilloscopes that have an ACmV range and Amprobe's DMII™ Data Logger Recorder and Harmonic Analyzers.
- Wide frequency bandwidth (8Hz to 20KHz) to monitor a much wider range of Currents that contain Harmonic components with extreme accuracy.
- The ACF-3000 measures 24 inches in length and can encircle a conductor up to 7.0 inches in diameter
- 2 "AA" alkaline batteries, instruction manual and leads are included.

SPECIFICATIONS

Output: Maximum, 300mVAC or+/- 420mVPeak Load (min), 500 Ohms Scaling, Switchable, 1mV= 1A (300 A Range); 0.1mV= 1A (3000 A Range)
Accuracy: +/- 1.0%*
Linearity: +/- 0.05%*
Repeatability: +/- 0.1% *
Frequency Response: (-3dB Points) 8Hz to 20KHz
Phase error (max): < +/-0.5 50-60 Hz
Noise (max): 1.0mV ac
DC offset (max): +/- 1.0mV
Temperature Range: Electronics -20 C to 85 C, (-4 F to 185 F)
Sensor Head & Cables -20 C to 90 C, (-4 F to 194 F)
Temperature Sensitivity: Gain change (max), +/-0.08%/°C, DC offset (max), +/- 0.006mV/°C
Power Source: +3.0Vdc supplied by (2) 1.5V "AA" cells or by mini power connector (2.0 mm) on end of enclosure, Use External Power supply Accessory, Model ACF-3
Battery Life: 60Hz and Full Output, 72 Hours
Controls: Switch (Range & Power), 300A/OFF/3000A LED Flashes once per 3 seconds if the ACF-3000 is on and the battery voltage is good.
Physical Specifications: Sensor Head: Material TPE rubber.
Polypropylene: Minimum Bending Radius 1.5 in. (38.1 mm)
Safety Rating, Category III Double Insulated 600V to Earth

Dimensions
Length (open): 24 in. (610 mm)
Sensor O.D. (closed): 8.3 in. (210.8 mm)
Sensor I.D. (closed): 7.0 in. (178.2 mm)
Weight: 0.4 lbs. (0.18 kg)
Cable Length (std): 78.7 in. (2.0 m)
Safety Rating, Category III Double Insulated 600V to Earth

Electronics Package
Material: ABS Plastic
Dimensions: 1.0"H x 2.4"W x .8" D (25.4H x 71.0W x 96.5 D mm)
Weight: 0.1 lbs. (0.045 kg)
Input: Flexible Transducer Head
Output Connector: BNC Female
Isolation: Hi-Pot test, sensor surface to output 5KVrms/60Hz/1 min

Position Sensitivity:
On Conductor (max) +/-1.0%*
Off Conductor, (Stray field max) +/-1.0%*

* Accuracy applies with full scale signal input to ACF-3000 as ordered: centered around bus/conductor: temperature at 25 C (+/-3 C): output load of 2K ohms or greater. All accuracies in these specifications are in terms of percent of full scale values.

Specifications are subject to change without notice

The ACF-3000 is shown with the Amprobe model AM-91 (meter not included)

ACCESSORIES AND REPLACEMENTS

Batteries, 2 "AA"	S915
BNC Male to BNC Male 12 in (304.8 mm)	ACF-1
BNC Female to Dual Banana Adaptor	ACF-2
Optional External PowerSupply (+3 0 VDC 100mA)	ACF-3
Harmonalyzer Adaptor. BNC Female to 3 5 mm phono plug	ACF-4
DMII™ Adaptor BNL Female to 2 Pin Connect Twist	ACF-5
Instruction Manual	964761

CT-30 DMM Accessory

FEATURES

CT-30

The CT-30 is a clamp-on current transducer that extends the capability of any DMM or recorder with a mVAC and/or mVDC range by allowing current measurement from 1mA to 30A AC or DC possible. The small jaw size enables measurements to be made in tight spaces where larger conventional clamp-ons cannot and also provide the means to measure very low currents in the milliamps (AC). Applications include load current measurement on AC branch circuits, leakage current (ACmA), secondary output of Current Transformers, and automotive or battery circuits (DC).

- Small jaw for tight spaces
- 400ACmA Range (1mVAC/ACmA)
- 4A AC and DC Range (100mV/A)
- 30A AC and DC Range (10mV/A)
- Pushbutton zero for DCA (eliminates residual magnetism)

SPECIFICATIONS

Indoor Use	
Conductor Size:	7/8" (23mm) max. (approx.)
Battery Type:	Two 1.5V "AA " AMPROBE Model S912
Range Selection:	Manual
Power Consumption:	10 mA (approx.)
Low Battery Indication:	Red LED
Operating Temperature:	32°F to 104°F (0°C to 40°C)
Operating Humidity:	Less than 85% relative
Storage Temperature:	-4°F to 140°F (-20°C to 63°C
Storage Humidity:	Less than 75% relative
Attitude:	Up to 2000M
Dimension:	183mm(L)x61.3mm(W)x35.6mm(H) 7.2"(L)x2.5"(W)x14"(H)
Weight:	6.7 oz. (190g) (Battery included)
Included:	Soft vinyl case mode SV-100 Users manual, Part number 964758 Test leads, Model TL-RBRB Two "AA" 1.5V batteries, Model S912

Specifications (Operating Temperature 0°C to 40°C)

Range	Output	Accuracy(23°C±5°C)		Accuracy(0°C to 10°C)		Accuracy(10°C to 40°C)	
DC 400mA	DC 1mV/mA	———		———		———	
DC 4A	DC	±2.0%±30mA		±4.0%±30mA		±3.0%±30mA	
	100mv/A						
		50/60Hz	40-100Hz	50/60Hz	40-100Hz	50/60Hz	40-100Hz
AC 400mA	AC 1mV/A	±2.0%±0.5mA	±2.0%±0.5mA	±4.0%±0.5mA	±5.0%±0.5mA	±3.0%±0.5mA	±3.0%±0.5mA
		50/60 Hz	40-400Hz	50/60Hz	40-400Hz	50/60Hz	40-400Hz
AC 4A (0-400mA)	AC 100mV/A	±2.5%±8mA	±3.0%±8mA	±5.0%±8mA	±6.0%±8mA	±3.5%±8mA	±4.0%±8mA
AC 4A (400mA-4A)	AC 100mV/A	±2.5%±3mA	±3.0%±6mA	±5.0%±3mA	±6.0%±6mA	±3.5%±3mA	±4.0%±6mA
AC 30A	AC 10mV/A	±2.0%±30mA	±2.5%±30mA	±4.0%±30mA	±5.0%±30mA	±3.0%±30mA	±3.5%±30mA

[1]400mA range is not designed for DC current measurement. The accuracy is ±2.5% ±1mA and is only used for reference. In the DC400mA range, the output would drift 0.4mV. For low DC milliamp (4-20mA DC) readings, we recommend looping the conductor two times around the jaw and dividing the reading by 3. This will allow a more stable reading.

CT-600, A-1000

FEATURE - CT-600

- 0-600 A AC/DC range
- Overload protection to 800 Amps AC/DC
- Green flashing LED Power ON indication
- Red LED low battery indication
- Maximum jaw capacity 1.33" (34 mm)
- 9V battery, carrying case, and non-shrouded banana adapters (VBAN) included
- Measure up to 600 amps AC or DC

CT-600

SPECIFICATIONS

AC Current Range: 0-100 Amps: 40-400 Hz (sine wave only)
Output Voltage: 10mVAC/A
0-600 Amps: 40-400 Hz (sine wave only)
Output voltage: 1mVAC/A
Accuracy: ±2% of rdg ±0.5A from 0-100 Amps (100 Amp range)
±2% of rdg ±2A from 100-600 Amps (600 Amp range)
DC Current Range: 0-100 Amps
Output Voltage: 10mV/A
0-600 Amps
Output Voltage: 1mV/A
Accuracy: ±2% of rdg ±0.5A from 0-100 Amps (100 Amp range)
±2% of rdg ±2A from 100-600 Amps (600 Amp range)
Load Impedance: (Multimeter Input Impedance) 5KΩ minimum
Positional Error: ±1%
Frequency Response: AC 40-400 Hz.
Battery Life: Minimum of 60 hours
Circuit Protection: 800 Amps AC/DC
Power Supply: One 9V battery, Model MN-1604, installed in unit
Operating Temperature/Relative Humidity: 32°F (0°C) to 122°F (50°C) 80% RH
Storage Temperature/Relative Humidity: -4°F (-20°C) to 140°F (60°C) 80% RH
Jaw Capacity: 1.33" (34mm) dia or .785" (20MM) x 1.57" (40mm) bus bar
Size: 8 1/2" x 2 7/8" x 1 1/16" (21.5 cm x 7.3 cm x 2.7cm)
Weight: 14.08 oz. (400 g)
Instruction Book: P/N 964750

FEATURES - A-1000

The Amprobe A-1000 allows a Non True RMS DMM to read True RMS Current and also has Waveform Display capabilities when used with an oscilloscope.

- ULc, CE, IEC and TUV approved
- AC & DC Current Ranges: 0-1000 Amps
- Output: 1 mV per Amp
- Crest Factor: 3:1
- Manual Zero Adjust
- DMM/Waveform Output Select Switch
- Power On & Low Battery LED Indicators
- Maximum Jaw Opening: Accommodates conductors 2" in diameter (50.8mm)

The A-1000 when used with the supplied accessory (DTL-ABNC) will also show you a Waveform when used with an Oscilloscope.

A-1000

SPECIFICATIONS

Accuracy is given as ±(% of reading + no. of least significant digits) at 23°C ± 5°C, with relative humidity Less than 80% R.H.

DC CURRENT (Waveform output)

Range	Output	Accuracy
0 - 100A	1mV/1A	±(1.5%rdg+0.3A)
100 - 1000A	1mV/A	±(2.0%rdg+1A)

AC CURRENT (Waveform output)

Range	Output	Accuracy (@40Hz-65Hz)	Accuracy (@65Hz-1KHz)	Accuracy (@1kHz-2kHz)
0 - 100A	1mV 1A	±(1.5%rdg+0.5A)	±(2.0%rdg+0.5A)	±(3%rdg+1A)
100 - 1000A	1mV/A	±(2.0%rdg+1A)	±(2.5%rdg+1A)	±(4%rdg+3A)

DC CURRENT (DMM output/TRUE RMS)

Range	Output	Accuracy
0 - 100A	1mV/1A	±(1.5%rdg+0.5A)
100 - 1000A	1mV/A	±(2.0%rdg+1A)

*Crest factor >3:1

AC CURRENT (DMM output/TRUE RMS)

Range	Output	Accuracy (@40Hz-65Hz)	Accuracy (@65Hz-1KHz)	Accuracy (@1kHz-2kHz)
0 - 100A	1mV 1A	±(1.5%rdg+0.5A)	±(2.0%rdg+0.5A)	±(3%rdg+1A)
100 - 1000A	1mV/A	±(2.0%rdg+1A)	±(2.5%rdg+1A)	±(4%rdg+3A)

Low Battery Indicator: The RED LED is lit when the battery voltage drops below 6.0V (approx.)
Operating Temperature: 0°C to 50°C (32°F to 120°F), 0-80% R.H.
Storage Temperature: -20°C to 60°C (-4°F to 140°F), 0-80% R.H. with BATTERY REMOVED.
Temperature Coefficient: 0.12% / °C (from 0°C to 18°C or 28°C to 50°C)
Power Supply: Single standard NEDA1604, JIS006P, IEC6F22 carbon zinc or alkaline type 9V battery.
Maximum Jaw Opening: To accommodate conductors 2" (50.8 mm) diameter
Dimension: 32(H) x 64(W) x 260(L) mm; 126"(H) x 2.52"(W) x 10.24"(L)
Weight: 780 grams with all accessories (1.72 lbs. with all accessories)
Supplied With: DTL-1000 Test Leads, DTL-ABNC Oscilloscope Lead, CC-ACDC Carrying Case, MN-1604, 9V Alkaline Battery, 978351 Instruction Manual
Safety: Designed to comply with IEC1010 - 1 Instrument Category (Overvoltage Category) III, 300V, Pollution Degree

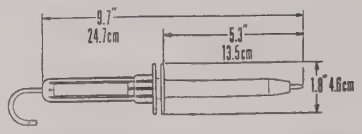
HV-2 & IR-100

FEATURES - HV-2 HIGH VOLTAGE PROBE

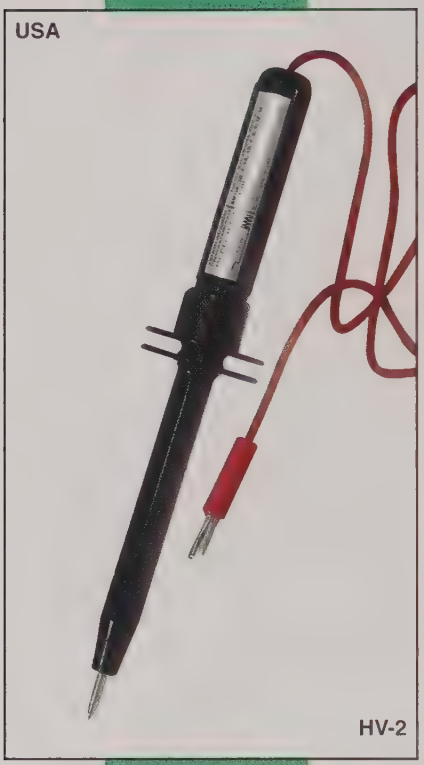
Ranges of 15KVAC and DC can be added to the multimeter through the use of the HV-2 High Voltage Probe and the HVR4 Resistor* (990MΩ, 2%) or HVR-41 Resistor* (990MΩ, 1%).

*Must be ordered separately

Note: The HV-2 with either the HVR-4 or HVR-41 Resistor can be used with any Digitial Multimeter that has a 10 Megohm input impedence on its Voltage ranges. The HV-2 with its resistor is a divide by 100 probe (i.e. 5000 Volts will read 50 Volts on the digitial multimeter).



USA



HV-2

FEATURES - IR-100 DIFFERENTIAL TEMPERATURE PROBE

The IR-100, IR-Probe™ non-contact ***differential*** temperature scanner is designed to compare the temperature of electrical equipment, or any target, to the surrounding environment (ambient). The operating condition of electrical connections, overloaded neutrals due to harmonic currents, circuit breakers, power panels, motors and bearings, transformers, ballasts in fluorescent lighting can be conveniently judged by the temperature rise above ambient. A color coded severity criteria card accompanies the IR-100 to guide you through your checks.

TEMPERATURE RISE	ACTION	COLOR
0 to 10°C (0 to 18°F) ***0 to + 1 mVDC***	No action indicated*	Green
10 to 15°C (18 to 27°F) ***+1 to + 1.5 mVDC***	Make note and plan to reinvestigate in 6 mos.	Yellow
15 to 20°C (27 to 36°F) ***+1.5 to 2 mVDC***	Schedule an investigation possible repairs at a convenient time.	Yellow
>20°C (> 36°F) ***> +2 mVDC***	Investigate immediately	Red
> 100°C (>180°F) ***> +10 mVDC***	Possible emergency	Red

Note: A (-) mV reading indicates target temperature lower than the probe temperature.

USA

IR-100

*A reading in this range (0 to 10°C) does not mean that a problem cannot exist. It means only that an infrared scan indicates normal temperature rise. For critical equipment, obtain the opinion of an inspection professional. If you detect even a small temperature rise, always move closer, if safety permits, and scan again.

For reference, 1°C rise (+0.1 mV) = 1.8°F rise. One handed operation - Clips to standard probe holder of DMM case. Works with any DMM with 10 megohm input impedance and 200.0 mV or similar DCV range.

In conditions where you have a hot breaker or an overloaded conductor, take a clamp-on (preferable TRMS type) AMPROBE instrument and make a current measurement.

Optional carrying case: "SV-12"

Protected by one or more of the following U.S. Patents; 4566808, 4626686, 4831258, 4874253, 4993419, 5229612, 5319202. Other U.S. & Foreign Patents Pending.

TABLE 1

mVDC	°C (Rise)
30	200
60	300
90	400
120	500
150	600

SPECIFICATIONS

Target Temperature Range: -50 to 1200°F (-46 to 650°C)
Accuracy: 1°C or 1.8°F @25°C ambient, 0.9 emissivity, meter error not included
Response time constant: .1 second (IR-Probe only - not including DMM)
Emissivity: 0.9 fixed
Power requirement: None, Powered by heat source
Operating Temperature: -50 to 175°F (-46 to 80°C)
Output signal*: 0.1mVDC/°C = 1.8°F temperature rise above probe temperature
Field of View: 4":1" ratio of distance to spot diameter
Construction: Drop proof, sealed, water resistant, no moving parts, high impact ABS. No calibration or temperature coefficient needed
Size: 7.5"L (19 cm) x .75"W (1.9 cm), coil cord: 1 ft. retracted, 6 ft. stretched
Weight: 2.4 oz. (68g)
Warranty: 1 year
Instruction Book: P/N 818234

For reference, 1°C rise (+0.1 mV) = 1.8°F rise. One handed operation - Clips to standard probe holder of DMM case Works with any DMM with 10 megohm input impedance and 200.0 mV or similar DCV range.

*For insulator targets up to approximately 100°C rise, for higher temperatures, refer to Table 1. Bare metal targets will read low due to low emissivity.

TMA-1 & TMA-K

FEATURES - TMA-1

Consists of the Multi-Temp® module and one TPSF probe. The TMA-1 allows users of digital multimeters to measure temperature directly in terms of DC millivolts. It also allows direct measurement of temperature difference (additional probe required). Fahrenheit or Celsius measurements are accomplished by selection of °F or °C probes. Probes are interchangeable and field replaceable. The Multi-Temp accessory can be used with a 3-1/2 (or more) digit multimeter with 200 millivolt and 2 volt DC (or similar) ranges. Input impedance should be ≥10 Megohms.

Multi-temp for AM-4B, AM-14, AM-15, AM-20, AM-21, AM-22, AM-1200, AM-1250, AM-1260, AM-1280, AM-90, AM-91, AM-16, AM-17, AM-18, PMM-1, ACD-12

SPECIFICATIONS

MODULE SPECIFICATIONS

Output: 1 millivolt per degree (F or C) ± .1%
Battery Life: 1,000 hours minimum continuous duty with alkaline battery (2 probes in use)
Size: 3 3/8" x 2" x 1 3/8" (excluding plugs)
Battery Test: Direct readout on users meter
Cord: Length - 7 feet
Instruction Book: P/N 933750

Power: One 9V battery
Ambient Temperature Range: 32°F to 120°F (0°C to 50°C)
Weight: 3 oz. (73g) with battery
Banana Plug Spacing: Standard 3/4"
Maximum Temperature: +221°F (105°C)

PROBE SPECIFICATIONS

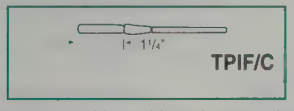
TEMPERATURE MEASURING RANGE
-50°F to 300°F (probe model TPIF) Immersion
-55°C to 150°C (probe model TPIC) Immersion
-50°F to 300°F (probe model TPSF) Surface
-55°C to 150°C (probe model TPSC) Surface
-50°F to 150°F (probe model TPAF) Air/Gas
-55°C to 65°C (probe model TPAC) Air/Gas

ACCURACY

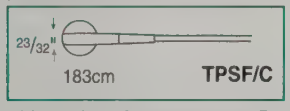
±2°F from 0°F to 230°F ±3°F all other points TPIF, TPSF
±1°C from -10°C to 110°C ±1.5°C all other points TPIC, TPSC
±3°F from -50°F to 0°F ±2°F from 0°F to 150°F TPAF
±1.5°C from -55°C to 0°C ±1°C from 0°C to 65°C TPAC

Do not use in corrosive applications.

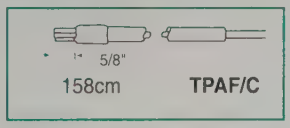
Immersion Probe - Nickel-plated copper probe



Surface Probe - Nickel-plated copper probe with flat disc



Air/Gas Probe - Vented housing permits free flow of air for rapid sensing of temperatures. Do not use in temperatures over 150°F.



READING RESOLUTION - Resolution is determined by the number of digits the digital multimeter has and the DC voltage range selected.

Example: 3 1/2 digits meter, 200mV range, °F resolution would be .1°F from -55°F to +199.9°F. Above 199.9°, the 2 volt range would have to be selected and resolution would be 1°F. Resolution would be .1°C over its entire range of -55°C to +150°C.

FEATURES - TMA-K

The TMA-K expands the capability of any Digital Multimeter with a DC millivolt range and allows direct measurement of temperature possible. The TMA-K plugs into a DMM and converts the output of the K-Type thermocouple's signal to a 1 millivolt DC per °C or °F signal that is displayed by the DMM. The user can select the temperature to be displayed in °C or °F by the slide switch on the module. The temperature measurement range can be expanded up to 1830°F (1000°C) using any properly rated K-type thermocouple. The TMA-K comes complete with thermocouple, model TPK-56 for temperature measurements from -40°F to +400°F (-40°C to 204°C), 9V battery, and instructions.

- Converts any DMM with DC millivolt scale into a thermometer
- -58°F to 1830°F (-50°C to 1000°C) Measurement Range
- Temperature scale in °C or °F, User Selectable
- Model TPK-56 K-Type Thermocouple and Battery Included

Inputs: K-Type Thermocouple
Measurement Range: -50°F to 1830°F (-50°C to 1000°C)
Storage Temperature: -7°F to 140°F (-20°C to 60°C) 0 to 80% R.H.
Temperature Coefficient: 0.1 x (Spec. Accuracy) per °F, <64°F or >82°C
0.15 x (Spec. Accuracy) per °C, <18°C or >28°C
Relative Humidity: 0% to 80%
Power Requirement: Standard 9V, NADA 1604 JIS 006P IEC 6F22
Battery Life: Alkaline 500 hours
Size: 4.8" (L) x 1.81"(W) x 1.18"(D) 122mm(L) x 46mm(W) x 30mm(D)

Output: 1 mVDC/°C or °F
Operating Temperature: 32°F to 122°F (0°C to 50°C) 0 to 80% R.H.

TEMPERATURE RANGE	ACCURACY
-58°F to -5.8°F	+/- 2.0%rdg +4°F
-50°C to -21°C	+/- 2.0%rdg +2°C
-4°F to 662°F	+/- 0.5%rdg +4°F
-20°F to 350°C	+/- 0.5%rdg +2°C
664°F to 932°F	+/- 2.0%rdg +4°F
351°C to 500°C	+/- 2.0%rdg +2°C
933°F to 1832°F	+/- 2.9%rdg +4°F
501°C to 1000°C	+/- 2.9%rdg +2°C

USA

TMA-1

TMA-K

MEGOHMMETERS

MEGOHMMETERS		AMB-5D	AMB-1A	AMB-2	AMB-4D	AMB-5D	AMC-2	AMC-3	AMC-4
MEASUREMENT RANGES	100 ohms / 0.3 VDC		X	X					
	200 ohms / 3 VDC				X				
	200 ohms / 6 VDC						X	X	X
	200 M ohms / 250 VDC				X				
	4000 M ohms / 250 VDC	X							
	100 M ohms / 500 VDC						X		X
	200 M ohms / 500 VDC		X		X				
	4000 M ohms / 500 VDC	X							
	4000 M ohms / 1000 VDC	X							
	500 M ohms / 1000 VDC							X	X
	2000 M ohms / 1000 VDC				X				
	500K to 500G ohms / 500 VDC					X			
	500K to 500G ohms / 1000 VDC					X			
	500K to 500G ohms / 2500 VDC					X			
	500K to 500G ohms / 5000 VDC					X			
AC Voltage Test Range	600V	X	X	X		X			
Battery Operated		X	X	X	X	X			
Hand Cranked							X	X	X
Digital Display		X			X				
Analog Display		X	X	X		X	X	X	X
Catalog Page Number		75	76	76	76	77	77	77	77

AMB-5D

FEATURES

- 3-3/4 digital LCD, 4000 count
- Auto range for mega ohm range
- 50 segments log scaled analog display
- Easy to carry testing package
- Tests insulation at rated voltage into a 1mA load
- 280mA short circuit continuity current
- Meet VDE 0413

AMB-5D

SPECIFICATIONS

AC VOLTAGE

Range:	600V ACV
Resolution:	0.1 Volt
Accuracy:	1.5% rdg + 3 dgt (1V-600V

CONTINUITY

Range:	400 Ohm (Max. Short Circuit Current 28OmA)
Resolution:	0.1Ω
Accuracy:	1% rdg + 5 dgt

MEG OHM

Range:	4MΩ/40MΩ/400MΩ/4000MΩ@250V 4MΩ/40MΩ/400MΩ/4000MΩ@500V 4MΩ/40MΩ/400MΩ/4000MΩ@1000V
Resolution:	4MΩ/1KΩ 40MΩ/10KΩ 400MΩ/100KΩ 4000MΩ/1MΩ
Accuracy:	3% rdg + 5 Count (under 2GΩ) 5% rdg + 3 Count (greater 2G)

Display: 80 x 50mm big LCD panel with 50 segments analog display
Max Reading 4000

Over range Indication: "OL" will be shown on the LCD panel when out of range measurement is made

Low Battery Indication: The ▭ will be shown when the batteries needs to be changed

Sampling Rate: 2.5 times/sec Digital Display 10 times/sec Bar Graph

Power Source: Eight 1.5 Volt AA size Batteries

Operating Temperature and Humidity: 32°F to 104°F (0°C to 40°C), below 80% RH

Storage Temperature: 14°F to 140°F (-10°C to 60°C)

Dimension: 200 (L) x 140 (W) x 95 (H) mm

Weight: Approx. 900g (with batteries)

Accessories: Test Leads, Batteries, Instruction Manual

AMB-1A, AMB-2 & AMB-4D

AMB-2

FEATURES - AMB-1A & AMB-2

- Battery Powered
- Helps cut unscheduled equipment downtime and reduce shock hazards
- Megohm Ranges
- Sensitive ohm Range
- Live circuit AC/DC voltage test
- Battery OK test
- Mirror scale
- 3-color scale plate
- Fuse protected
- Automatic discharge of equipment capacitance for safe removal of test leads
- Leak-proof compartment
- Rugged taut band meter movement

SPECIFICATIONS

AMB-1A Ranges: 0-100 Megohms (2.5 Megohms midscale)
Test voltage 500VDC (max. current 3mA)
0-100 ohms (4 ohms midscale)
Open circuit voltage 300mV
0-600VAC/DC test band
Battery OK test band

AMB-2 Ranges: 0-100 Megohms (2.5 Megohms midscale)
Test voltage 500VDC (max. current 3mA)
0-50 Megohms (1.5 Megohms midscale)
Test voltage 250VDC (max. current 1.5mA)
0-100 ohms (4 ohms midscale)
Open circuit voltage 300mV
0-600VAC/DC test band
Battery OK test band

Accuracy: Megohm range 0.1 to 10 Megohms ± 5% of reading.
Over 10 Megohms ± 10% of reading
Ohmmeter range ± 3% of arc

Power: 8 "AA" batteries (not supplied)

Battery Drain: 50mA @ 1 megohm. This translates into over 200 test cycles-one minute on measuring 1 megohm and four minutes off

Fuse: 8AG-361, 1 amp fast blow (1 spare supplied).

Size: 4.09" x 6.25" x 2.81" (10.4cm x 15.9cm x 7.14cm)

Instrument Weight: 1 lb. 3 oz. (538 g) without batteries

Test Leads: MTL-6

Supplied complete with an ever-ready carrying case, test leads, adaptor clips, fuse, and an Instruction Book (AMB-1A) P/N 947758 or (AMB-2) P/N 947760

AMB-4D

FEATURES - AMB-4D

- Built-in timer and signal which automatically performs the Dielectric Absorption Ratio Test
- Response time of less than 5 seconds
- Sampling rate of no less than 2 time/second
- Safety leads with screw-on alligator clips
- Powered by 6 "AA" batteries.
- Low battery indication
- Manual or automatic operation
- Audible and visual indication in the auto mode
- Auto shut-off after 3 minutes. Dielectric Absorption Ratio test only

SPECIFICATIONS

Ranges	DC Test Voltages	Range Accuracy
0-200Ω	3VDC	± 1% of reading ±2 LSD
0-200MΩ	250VDC ± 12.5VDC	± 3% of reading ±2 LSD
0-200MΩ	500VDC ± 25VDC	± 3% of reading ±2 LSD
0-2000MΩ	1000VDC ± 50VDC	0-1000MΩ ±3% of reading ±2 LSD 1000MΩ - 2000MΩ ±3.5% of reading±2 LSD

Display: 3 1/2 LCD
Response Time: Less than 5 seconds
Sampling Rate: Minimum of 2 times per second.
Power Supply: 6 "AA" batteries, not supplied with unit.
Current Drain: 65mA max. on Megohm; 17mA max. on Ohm
Low Battery Indication: "BAT"
Visual Indication: Arrow pointing up in data hold mode.
Audible Indication: 1 beep per second while instrument in data hold mode.
Operating Temperature/Relative Humidity: 32°F (0°C) to 120°F (49°C) 80%RH
Storage Temperature/Relative Humidity: 20°F (-6°C) to 140°F (60°C) 80%RH
Size: 4 1/4" x 6" x 3 1/2" (10.79cm x 15cm x 8.89cm)
Weight: 14.9 oz. (422g) without batteries

Resolution:
200Ω 0.1Ω
200MΩ 0.1MΩ
2000MΩ 1.0MΩ

Max. Current:
200MΩ (250V) 0.42mA
200MΩ (500V) 0.82mA
2000MΩ (1000V) 1.2mA

Supplied complete with carrying case, test leads (MTL-6) with alligator clips (MTC-3), and an Instruction Book P/N 947763.

AMB-5KV & AMC-2, 3 & 4

FEATURES

The AMB-5KV is a battery operated, high voltage insulation resistance tester measuring up to 500 G ohms of resistance. The unit will provide four DC test voltages, 500V, 1KV, 2.5KV & 5KV. The AMB-5KV also acts as a AC/DC Voltmeter. This feature insures that zero (0) voltage is present prior to making an insulation resistance test and will act as a capacitive discharge indicator.

The AMB-5KV Insulation Resistance Tester is ideal for checking Motor Windings, Insulators, Generator Windings, etc.

SPECIFICATIONS

INSULATION RESISTANCE

Measuring range:	500K thru 500G ohms
Test Voltages:	500,1000, 2500 & 5000 Volts DC
Max. short ckt. test current:	Approx. 1.3mA
Scale:	Logarithmic, 90mm length
Working temperature range:	32°F thru 104°F (0-40°C).
Accuracy:	+/- 2mm
Test Hold capability:	Built in
Discharging of line:	Automatic, as long as "Insulation Test" push button is not pushed.

VOLTAGE

Measuring range:	0-600 Volts AC/DC
Input resistance (DC):	3 Meg ohm
Input resistance (AC):	1.35 Meg ohm
Scale:	Linear, 90mm length
Accuracy:	± 2% of full scale

GENERAL

Power supply:	4 "D" size alkaline batteries (IEC R20)
LOW BATTERY indicator:	Red LED
Dimensions (WxHxL):	13.6" (345mm) x 5.1" (130mm) x 9.8" (250mm)
Case:	High impact, Rugged ABS plastic
Weight:	9.9 lbs (4.5 Kg.)

OVERLOAD PROTECTION

Voltage input:	1000 Volts AC or DC Maximum
Insulation Resistance input:	600 Volts AC. ("Insulation Test" pushbutton depressed,Instrument connected to a voltage

Test Leads are 2m long (76")

AMB-5KV

ACCESSORIES AND REPLACEMENTS

Test Lead Kit (set of 3)	MTL-5KV (included with instrument)
Batteries, "D" size (set of 4)	MN-1300 (NOT included with instrument)
Instruction Book (AMB-5KV)	P/N 947770

FEATURES - AMC-2, 3, 4

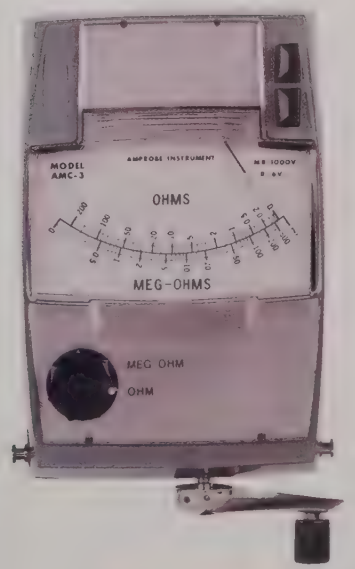
The instrument's test voltage is obtained by means of a hand-cranked, constant voltage generator. This means it does not require any other power supply and is, therefore, always ready for use. This unit's sensitive ohmmeter range makes it especially well suited for measuring the resistance of motor windings and other low resistances. Guard Terminal eliminates effect of any surface leakage that may influence reading. Supplied with an application manual, a three-piece test lead set (2 clip-type and 1 probe-type) and dual carrying cases for the instrument and test leads.

- Megohm range(s)
- Sensitive ohm range
- Guard terminal
- Light and smooth operating crank
- Rugged cross-coil movement
- High-impact housing
- Spring-loaded terminal connection
- Constant voltage generator

SPECIFICATIONS

MODEL	RANGES	TEST VOLTAGE	ACCURACY
AMC-2	0-100MΩ (1MΩ midscale) (1.5mA Max)	500 VDC	± 5% of reading from .1 to 50MΩ ± 10% of reading at all other points
	0-200 ohms (10Ω midscale	6VDC	± 10% of reading
AMC-3	0-500MΩ (5MΩ midscale (1.3mA Max)	1000VDC	± 5% of reading from .5 to 200MΩ ± 10% of reading at all other points
	0-200 ohms (10Ω midscale)	6VDC	± 10% of reading
AMC-4	0-100MΩΩ (3MΩ midscale) (1.3mA Max)	500 VDC	± 5% of reading from .1 to 50MΩ ± 10% of reading at all other points
	0-500MΩ (6MΩ midscale (1.1mA Max)	1000VDC	± 5% of reading from .5 to 100MΩ ± 10% of reading at all other points
	0-200 ohms (10Ω midscale)	6VDC	± 10% of reading

Size: 4" x 3.6" x 7" (10.2cm x 9.2cm x 17.8cm)
Instrument Weight: 2 lbs. 8 oz. (1.13Kg)



AMC-3

ACCESSORIES AND REPLACEMENTS

Carrying case for AMB-1A, AMB-2	MOB
Carrying case for AMB-4D	MOD
Carrying case for AMC-2, 3 and 4 instrument	MOC
Carrying case for AMC-2, 3 and 4 leads	MOL
Test leads for AMC-2, 3 and 4 (set of 3)	MTL-3
Test leads for AMB-1A, AMB-2 and AMB-4D	MTL-6
Adaptor clips for MTL-6	MTC-3
"AA" Batteries (pkg. of 4)	915
"AA" Battery (pkg. of 1)	S915
Fuse for AMB-1A, AMB-2 (1 amp fast blow)	8AG361
Instruction Book (AMC-2,3,4)	P/N 947750

ANALOG MULTIMETERS

ANALOG MULTIMETERS		AM-1E	AM-2E	AM-2EDP	AM-3E	AM-6B	PY-13
AC Voltage (max)	500 @ 2k ohms/V Sensitivity						X
	600 @ 4k ohms/V Sensitivity					X	
	600 @ 10k ohms/V Sensitivity	X					
	750 @ 10k ohms/V Sensitivity				X		
	1000 @ 10k ohms/V Sensitivity		X	X			
DC Voltage	m Volts	X			X		
DC Voltage (max)	300 @ 100k ohms/V Sensitivity				X		
	500 @ 2k ohms/Sensitivity						X
	600 @ 4k ohms/V Sensitivity					X	
	600 @ 30k ohms/V Sensitivity	X					
	1000 @ 30k ohms/V Sensitivity		X	X			
DC Amp	µA		X	X	X	X	
	mA	X	X	X	X	X	X
Frequency Response Hz	50/60	X	X	X	X	X	X
Temperature (optional probe required)		X	X	X	X		
Ohms		X	X	X	X	X	X
Battery Tester						X	X
Catalog Pg. Number		78	79	79	80	81	81

USA

AM-1E

FEATURES - AM-1E

- 4 ohmmeter ranges including sensitive 5-ohm midscale
- Two millivolt ranges
- High temperature capability + 70° to + 1200°F
- Molded case, fully insulated
- All-weather test leads
- Meter movement overload protective circuitry
- "Off" position on range switch
- 30,000 ohm/V sensitivity

SPECIFICATIONS

Voltage Ranges: AC: 0-30/150/300/600 (10,000 ohms/V)
DC: 0-3/15/30/300/600 (30,000 ohms/V
15KVAC and 15KVDC ranges can be added through use of HV-2 high voltage probe and HVR-1 or HVR-1ED resistor available separately.
Resistance Ranges: RX1 200Ω (5Ω midscale)
RX10 2KΩ (50Ω midscale)
RX100 20KΩ (500Ω midscale)
RX1K 200KΩ (5KΩ midscale)
Current Ranges: 0-30/150mA at 300mV
DC Millivolt Ranges: 0-60 / 1200 at 33µA (Note: "At 33µA" refers to the current draw at full scale value of the range indicated).
Temperature Range: + 70°F to + 1200°F with TC-3 Thermocouple (not supplied).
Accuracy: ±3% of F.S. on DC
±4% of F.S. on AC
±3% of Arc on ohms
±2% of F.S. on temperature
Ohmmeter Battery: Four type "AA" (not supplied)
Fuse: 1 #8AG361, 1 Amp Fast Blow (Protects all ohms and current)
Size: 5.1"h x 3.5"w x 1.965"d (12.95cm x 8.89cm x 4.99cm)
Weight: 8-1/2 oz. (240g)

Supplied with MTL-2 all-weather test leads and MTC-3 alligator clip adaptor.

Instruction Book: P/N 936751

HIGH VOLTAGE PROBE FOR AM-1E & AM-3E - Ranges of 15KVAC and DC can be added to the AM-1E through the use of the HV-2 High Voltage Probe and the HVR-1* (AC volts) or HVR-1ED* (DC volts) Resistor.

*Must order separately.

AM-2E & AM-2EDP

FEATURES

- 33.3µA sensitivity
- 20 ohm midscale ohmmeter
- 2 temperature ranges
- 1.8VDC battery test range under load conditions
- All ranges are fuse protected to 220V or can with stand misapplication of 220V

USA

AM-2E

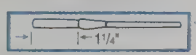
SPECIFICATIONS

Voltage Ranges:	AC: 0-10/50/125/250/1000 (10,000 ohms/V)		
	DC: 0-0.5/2.5/10/25/125/250/1000 (30,000 ohms/V)		
Resistance Ranges:	Rx1	500Ω	(20Ω midscale)
	Rx10	5KΩ	(200Ω midscale)
	KΩ	1 megohm	(10KΩ midscale)
Current Ranges:	DC: 0-25/250mA, 0-50 µA		
Temperature Ranges:	Low: -50°F to + 100°F (KΩ range)		
	High: 0°F to + 250°F (Rx10 range)		

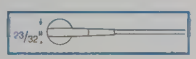
NOTE: Use one RBT-11B, RBT-12B or RBT-13B temperature probe, available separately.
Battery Test Range: 1.8 VDC
Accuracy: ±3% of F.S. on all ranges except 10 VAC range, which is ±4% F.S.
Temperature accuracy ±3% of arc
Ohmmeter Battery: One type "AA" (not supplied)
Fuse: One 8AG-361.5 (.5 amp fast blow)
Size: 5.345"h x 3.60"w x 1.53"d (13.57cm x 9.14cm x 3.89cm)
Weight: 7 1/2 ozs. (212 g)
Supplied with test leads MTL-2.
Instruction Book: P/N 936751

TEMPERATURE PROBES

All "RBT" probes have 15 foot (4.57m) lead. Probes are intended for non-corrosive applications only.

Immersion Probe:
Nickel-plated copper probe — 

RBT-11B

Universal Probe
Nickel-plated copper probe with flat disc — 

RBT-12B

Air Probe
Vented housing permits free flow of air for rapid sensing of temperatures. **RBT-13B**
Do not use in temperatures over 150°F

ACCESSORIES AND REPLACEMENTS

All weather test leads for AM-1A, AM-2A, AM-2B, AM-2BB, AM-2DP, AM-2BDP, AM-2BBDP, AM-6 (remain flexible to -10°F)	MTL-1
All weather test leads for AM-1E, AM-2E, AM-3E (remain flexible to -10°F)	MTL-2
All weather test leads for AM-6B	MTL-6A
Alligator clip adaptors (one red, one black) to convert MTL-1/MTL-2 type test lead probe tips to clip-on leads	MTC-3
750VAC high voltage lead for model AM-1A only	MTL5X
Current transducer 0-5/25/100/250 amps 60 Hz for AM-3E	A603
Current transducer 0-5/25/100/250 amps 50 Hz for AM-3E	A653
Current transducer 0-10/50/250/500 amps 60 Hz for AM-3E	A703
Current transducer 0-10/50/250/500 amps 50 Hz for AM-3E	A753
15KV high voltage probe for AM-1E, AM-3E. (Add resistor)	HV-2
Resistor (133.7MΩ, 2%) for 15KVAC range. Use with HV-2 and AM-1E	HVR-1
Resistor (450MΩ, 2%) for 15KVDC range. Use with HV-2 and AM-1E	HVR-1ED
Resistor (300MΩ, 2%) for 15KVAC range. use with HV-2 and AM-1A	HVR-3
Resistor (148.5MΩ, 2%) for 15KVDC range. Use with HV-2 and AM-3E	HVR-3
Replacement probe tip for HV-2	HVPT
Carrying case for AM-1A, AM-1E, AM-2A, AM-2B, AM-2BB, AM-2E AM-2DP, AM-2BDP, AM-2BBDP	MM
Carrying case for AM-3E	MM-3
Deluxe carrying case for AM-3E	MM-4
Soft vinyl zippered pouch for AM-6A/B	SV
Thermocouple temperature probe for AM-1A, AM-1E, AM-3E (+70°F to + 1200°F)	TC-3
Immersion temperature probe for AM-2B, AM-2BB, AM-2E, AM-2BDP, AM-2BBDP, AM-3E	RBT-11B*
Universal temperature probe for AM-2B, AM-2BB, AM-2E, AM-2BDP, AM-2BBDP, AM-3E	RBT-12B*
Vented air temperature probe for AM-2B, AM-2BB, AM-2E, AM-2BDP, AM-2BBDP, AM-3E	RBT-13B†
Battery (pkg. of 1) Type AA	S915
Battery (pkg. of 4) Type AA	915
Battery (pkg. of 2) Type C	MN-1400
Fuse (1 amp) for AM-1A, AM-1E, & AM-3E ohmmeter	8AG361
Fuse (.5 amp) for AM-2E	8AG-361.5
Fuse (.1 amp) for AM-6, AM-6A	8AG-361-6
Fuse (0.1 amp) for AM-3E	3AG-312
Fuse (.3 amp) for AM-2A, AM-2B, AM-2BB, AM-2DP, AM-2BDP, AM-2BBDP	3AG-312A
Fuse for AM-6B	(.5 amp) 5x20mm/250V

*For non-corrosive applications only †Do not exceed temperatures of 150°F

AM-3E

FEATURES

- Mirror scale
- High impact molded case, fully-insulated
- Self-locking meter stand handle
- All-weather test leads
- Recessed glass window reduces possibility of scratches and static electricity build-up
- All ranges are fuse protected or can withstand the momentary misapplication of 220 volts maximum.

USA

AM-3E

SPECIFICATIONS

MODEL AM-3E IS SUPPLIED WITH MTL-2 ALL-WEATHER TEST LEADS AND MTC-3 ALLIGATOR CLIP ADAPTORS. ALL OTHER ACCESSORIES AVAILABLE SEPARATELY.

Voltage Ranges: AC 0-30 / 150 / 300 / 750 (10,000 ohms/V)
DC 0-3 / 30 / 150 / 300 (100,000 ohms/V)
15KVAC and 15KV DC ranges can be added through us of HV-2 High Voltage Probe and HVR-3 (AC volts) or HVR-3D (DC volts) resistor.

Resistance Ranges: 0-500 ohms with 5 ohms midscale
0-5,000 ohms with 50 ohms midscale
0-50,000 ohms with 500 ohms midscale
0-5 Megohms with 50,000 ohms midscale

Current Ranges:
DC - 0-10 µA
0-15/150 µA @ 300mV
0-1.5/150mA @ 300mV

AC - 0-5/25/100/250 amps with accuracy current transducer A603 (60Hz) or A653 (50Hz)
0-0.5/2.5/10 amps with accuracy A603 or A653 and energizer A47-L.

0-50/1000/1200 amps with accuracy A603 or A653 and Deca-Tran® A50-1.

0-1250/5000/6000 amps with accuracy A603 or A653 and Amptran® CT50-1 or CT50-2
0-10/50/250/500 amps with accessory current transducer A703 (60Hz) or A753 (50Hz)
0-1 / 5 amps with A703 or A753 and energizer A47-L.
0-100/1200 amps with A703 or A753 and Deca-Tran® A50-1.
0-2500/6000 amps with A703 or A753 and Amptran® CT50-1 or CT50-2

Millivolt Ranges: 0-75/750 /1500mV DC at 10µA
0-300mV DC

Temperature Ranges:
Low: -10°F to + 250°F with probe RBT-11B or RBT-12B or RBT-13B (for non-corrosive applications).
RBT-13B should not be used in temperatures above 150°F.
High: + 70°F to + 1200°F with probe TC-3.

Accuracy: DC: ±3% F.S.
VAC: ±4% F.S.
Amperes AC: ±5% F.S.
Resistance: ±3% of arc
Low Temperature: ±3% of Arc including probe
High Temperature: ±3% of F.S. including probe

Ohmmeter Power Supply:
2 "C" Alkaline batteries in parallel

Circuit Protection: 1 #8AG361, 1 amp fast blow
1 #3AG312, 0.1 amp fast blow
Do not use substitute fuses as resistance can vary

Size: 5 1/4" x 7 1/2" x 3 1/4"d (13.34cm x 19.1cm x 8.26cm)
Instrument Weight: 2 1/4 lbs. (1.02Kg)
Temperature Probes: The range -10% to + 250°F is obtained by one of the temperature probes RBT-11B, RBT-12B or RBT-13B (all for non-corrosive applications only) which plug directly into the AM-3E. Lead length 12 feet (3.65m). .The range of + 70° to + 1200°F is obtained by using TX-3 Thermocouple. Length 5 1/2 ft. (1.67m).

USA

TAM-3E

Note: For earlier model AM-3, use temperature probes RBT-11, RBT-12, RBT-13. These probes will not fit model AM-3B or AM-3E.

CARRYING CASES
A choice of two rugged, ever-ready cases. The MM-3 provides storage space for the AM-3E and one or two accessories.

The MM-4 is a two compartment case that accommodates the AM-3E, the test leads, a temperature probe, the TC-3 and the A603 or A703. Instruction Book: P/N 936752

MODEL TAM-3E TEST MASTER KIT

This professional kit will satisfy the majority of your daily testing needs. Measure AC amps and volts, DC micro and mill-amps; DC millivolts and volts; Resistance; Temperature.

Contains AM-3E Multimeter, A603. Clamp-on Current Transducer. RBT-12B Universal Temperature Probe and TC-3 Thermocouple in the Deluxe MM4 Carrying Case. A653 for 50Hz. (Specify).
The TAM-3E has the same Voltage, Resistance, Millivolt, DC Current Ranges as model AM-3E, plus: AC 0-5 / 25 / 100 / 250 Amperes (with A603 60Hz or A653 50Hz)
Temperature Ranges: -10°F to + 250°F (with RBT-12B in non-corrosive applications) + 70°F to + 1200°F (with TC-3).

AM-6B & PY-13

FEATURES - AM-6B

- Fuse and diode protected for misapplication up to 250V
- Three color-coded scale and switch plates
- 5µA to 300mADC Current measurement capability
- 10mV to 600VDC Voltage measurement capability
- Dual Resistance Scale up to 1MΩ
- Battery Tester Scale
- Decibel Scale for Telecommunications
- All measurements made from same inputs
- Mirrored Display

AM-6B

SPECIFICATIONS

Voltage Ranges: AC: 0-30/120/300/600V (4KΩ/Volt)
DC: 0-0.3/3/12/30/300/600V (4KΩ/Volt)

Resistance Ranges: X1:2KΩ, 30Ω mid -scale (0.5Ω resolution from 0-5Ω)
X100: 200KΩ, 3KΩ mid-scale (50Ω resolution from 0-500Ω)
KΩ: 1MΩ, 10KΩ mid-scale (200Ω resolution from 0-5KΩ)

DC Current Ranges: 0-250µA/3mA/30mA/300mA

Battery Test Range: 0-1.5VDC

db Ranges:

(30 VAC):	-10 - +31dB
(120 VAC):	+2 - +43dB (add 12 dB to readout)
(300 VAC):	+10 - +51dB (add 20 dB to readout)
(600 VAC):	+16 - +57dB (add 26 dB to readout)
	(reference: 0dB=.775v, 600Ω)

Accuracy:

AC Volts:	+/-4% full scale
DC Volts:	+/-3% full scale
Resistance:	+/-3% of arc
DC milliamps:	+/-3% full scale
1.5V Battery Test:	+/-5% of arc
dB:	+/-4% of arc

Frequency Response: 50-60Hz

Ohmmeter Battery: Amprobe part number SN915 (AA) included

Fuse: Amprobe part # 5X20-250.5, 0.5A/250V fast blow type, 1 spare incl.

Dimensions: 5.5"(L) x 3.7"(W) x 1.6"(H); 14 cm(L) x 9.4cm(W) x 4cm(H)

Approximate Weight: 7.5 oz. (212g)

Test Leads: MTL-6B

Instruction Book: 936760

FEATURES - PY-13

Analog Multimeter

- 5 Functions
- 13 Ranges
- Fuse protected
- AC Volts to 500, DC Volts to 500, DC Current to 250mA, Battery Test feature, Resistance to 1M ohm
- Voltage rating on test leads - 600V

PY-13

Model		BT-100	CT-100	CT-326B	AT-1000	AT-2001	AT-2002	AT-2003	AT-2004	**AT-2005
Live Breakers		X	X	X	X	X	X		X	X
Live Lines	to 300V		X		X	X				
	to 600V			X			X		X	X
De-energized Circuits					X			X	X	X
Short Circuits			X	X	X	X	X	X	X	X
Open Circuits				X*	X	X*	X*	X	X	X
Ground Faults				X		X	X	X	X	X
Buried Lines				X		X	X	X	X	X
Inductive Capabilities									X	X
CE Approved					X	X	X	X	X	X
UL Approved		X								
Page Number		82	83	83	84	85	85	85	85	85

*If enough voltage is applied and circuit allows transmitter to turn on.
Applies to buried lines or wires in metallic conduit only.

** Includes B2025 Battery Booster and B2025 Recharger that triples the output of the T2200 transmitter.

BT-100

FEATURES - BT-100 Break'r Trac'r™

- Identifies 120V AC circuit breaker or fuse supplying a receptacle or lighting fixture
- Perfect for residential applications
- Economically Priced
- Eliminates trial and error troubleshooting
- No need to shut off power
- Audible tone and LED display confirm breaker identification
- Adjustable sensitivity enables pinpoint accuracy
- UL approved

SPECIFICATIONS

Operating Frequency: 47-63Hz

Voltage Range: 120VAC +/- 5%

Weight (approx)

BT-100T (Transmitter): 1.6 oz.
BT-100R (Receiver): 2.6 oz.

Operating Temp: 32 -122°F (0-50°C)

Power: Alkaline 9V Battery, Amprobe Model MN1604 (not included)

Instruction Book: P/N 937749

CIRCUIT TRACERS

FEATURES CT-100 & CT-326 Current Tracers

For use on energized circuits, the Current Tracer performs without the need to interrupt power and can locate breakers, neutral and ground lines, shorts and ground faults and locate and trace wires in floors, walls, conduit, computer cables and other cables.

The Current Tracer operates on the theory of High Audible Frequency load signals. The Current Tracers use a load signal generator (referred to as a transmitter) which turns on and off at the rate of 6.25KHz. The change in current, though very small (200mA peak), can be measured anywhere along the path of the circuit that the transmitter is on and is picked up by the specially tuned probe.

NOTE: Will not interfere with sensitive electronic equipment.

SPECIFICATIONS

General
Operating Frequency: 6.25KHz
Operating Temperature: 0°F to 120°F
Storage Temperature: -40°F to +150°F
Cases: Flame resistant ABS plastic
Case Size: 12 1/8" x 3 5/8" x 8" (5.4 cm x 9.21cm x 20.32cm)
Transmitter Duty Cycle: Will transmit for .164 seconds every .82 seconds. Digital crystal controlled circuit.
Weight: 4lbs (1.81 Kg)

Transmitter T100
Operating Voltage: 9-300 VAC/DC
Line Frequency Range: DC to 5KHz
Maximum Load: 200mA peak at 110 volts

Transmitter T300
Operating Voltage: 6-300VAC/DC
Line Frequency Range: DC to 5KHz
Maximum Load: 200mA peak at 110 volts

Probe P100
60Hz Rejection: 150dB
400Hz Rejection: 100dB
Power: 9V alkaline battery
Battery Life: 100 Hours (with normal use)
Sensitivity Adjustment Positions: 3 (x1, x2, x25)

Probe P26
50 & 60Hz Rejection: -156dB to 20K amps
Power: 9V alkaline battery
Battery Life: 100 Hours (with normal use)
Sensitivity Adjustment Positions: 12

Best Performer on the Market

Model CT-100: 9-300 volts AC/DC, includes P100 probe, T-100 transmitter, PC326 power cord, PT26 pigtail connector and AD-1 adapter.

Model CT-326B: 6-300 volts AC/DC, 300-600 volts AC, includes P26 probe, T-300 transmitter, 600CKA (2:1 transformer) voltage converter, EP-1001 earphone, PC326 power cord, AD-1 adapter and PT26 pigtail connector

Model CT-326B has a probe range of over 13 feet! Includes: carrying case, 9V battery and extra fuse.

Instruction Book (CT-100): P/N 79001-10
Instruction Book (CT-326B): P/N 937750

USA

CT-100

USA

CT-326B

U.S. Patents No. 4,491,785; 4,642,556; 4,775,832; 4,804,907;
Canadian Patent Nos. 1,219,911; 1,219,912.
Other U.S. & Foreign patents pending.

TRACERS (cont'd.)

ACCESSORIES & REPLACEMENTS (CT-100 & CT-326B)

Adaptor	AD-1
Earphone for P1000A, CT326, CT326B, CT326F	EP-1000
Signal return cable for T100A	SRC-15
Open Tracer probe	P1000A
Open Tracer transmitter	T1000A1/16 amp 250V slow blow fuse for T23
3AG-313.062	
1/4 amp 250V normal blow fuse for T10, T100 & T300	3AG-312.250
1/4 amp 250V normal blow fuse for T300F	5X20-216.250
Power cord for T300	PC-326
Power cord for T300F	FC-326
Probe for CT100	P100
Probe for CT10, CT23, CT23B, CT23-10B	P23
Probe for CT326, CT326B	P26
9V alkaline battery	MN1604
Current Tracer transmitter for 9-50VAC/DC	T10
Current Tracer transmitter for 50-140VAC/DC	T23
Current Tracer transmitter for 9-300VAC/DC	T100
Current Tracer transmitter for 6-300VAC/DC	T300
Current Tracer transmitter for CT326F	T300F
2-to-1 or 4-to-1 switchable voltage converter (140-600VAC) for Current Tracer transmitter	600CK
Pigtail connector for T23 Current Tracer transmitter	PT23
Pigtail connector for CT326, CT326B, CT326F Current Tracer transmitter	PT26
Carrying case for CT10, CT23, CT23B, CT23-10B	CC6-CT
Carrying Case for OT100A	CC6-OT
Carrying Case for CT326, CT326B, CT326F	CC-326
Carrying Case for CT100	CC-100

USA

AT-1000

FEATURES - AT-1000 Advanced Tracer

- Trace Energized Lines up to 300V AC or DC
- Trace Deenergized and Open Conductors
- Identify Breakers and Fuses without powering down
- Locate Shorts
- Identify Wires in a bundle
- Identify Control, Alarm, and Telephone System Wiring
- Trace Coaxial Cable

SPECIFICATIONS

Operating Frequency: 17kHz
Operating Temperature: 0˚F to 120˚F (-18˚C to 49˚C)
Storage Temperature: -40˚F to 150˚F (-40˚C to 66˚C)
Receiver-Transmitter Range: 1-3 feet

R1000 Receiver
Detectors: Electromagnetic coil (current mode)
Electrostatic plate (open mode)
Power: 9V Battery, IEC #6LR61, Amprobe Model MN1604
Current Consumption: 14mA with no LED's on 33 mA with LED's on
Low Battery Indicator: 6.0V
Min. Operating Voltage: 5.7V
Case Material: Fire Retardant ABS 911(or equivalent)

X1000 Transmitter
Input Power: 9V Battery, IEC #6LR61, Amprobe Model MN1604
Input Current: 8mA with new 9V Battery
Output Current: 15mA R.M.S. into a short circuit
Operating Voltage: 0-300V AC or DC
Case Material: Fire Retardant ABS 911 (or equivalent)
Included Accessories: SV-1000 Soft Carrying Case, C2901 & C2902 Cord Sets, AD-1 Adapter, Instruction Manual (part number 937780)

Protected by US Patent No 5,413,499.
Other U.S. and international patents pending.

AT-2000 SERIES

Designed to handle the majority of tracing applications, the AT-2000 series of Advanced Tracers combine 11 years of experience and three different technologies into one multi-purpose instrument. Economically priced, fully portable and easy to use, the AT-2000 series has the following capabilities:

- 5 models to choose from
- Trace live conductors buried up to 13 feet.
- Trace and identify load-side equipment from the circuit breaker **while energized.**
- Trace line-side wiring without power interruption on circuits from 9 to 600 volts AC or DC
- Trace open wires for over a mile
- Trace wire in conduit or, even the conduit itself
- Locate ground faults and shorts
- Identify individual wires in a bundle
- All units are fully fused protected and intrinsically safe.

CE

FEATURES - AT-2001

Includes the R2000 Receiver, S2300 Load Signal Generator (9-300V AC/DC), C2901, C2902 Cordsets, AD-1 Adaptor and Manual

FEATURES - AT-2002

Includes the R2000 Receiver, S2600 Load Signal Generator (9-600V AC/DC), C2901, C2902 Cordsets, AD-1 Adaptor and Manual

FEATURES - AT-2003

Includes the R2000 Receiver, T2200 Transmitter C2902 Cordset, AD-1 Adaptor and Manual

FEATURES - AT-2004

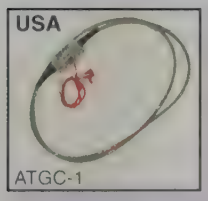
Includes the R2000 Receiver, S2600 Load Signal Generator (9-600V AC/DC) T2200 Transmitter, C2902 & C2901 Cordset, AD-1 Adaptor, A2201 clamp, manual.

FEATURES - AT-2005

Includes the R2000 receiver, S2600 load signal generator, T2200 transmitter, A2201 clamp, C2901 and C2902 cordsets, AD-1 adapter, B2024 battery booster, B2025 recharger/converter, and P/N 937775

General
Operating Temperature: 0 to 120°F
Storage Temperature: -40 to 150°F
Case Material: ABS
Case Size: 11" x 15 ½" x 4" (39.4 x 27.9 x 10.2 cm)
Total Weight: 4 lbs 5 oz. (1.95 Kg) for AT-2004
3 lbs 5 oz. for AT-2001, AT-2002, AT-2003
6 lbs. 3 oz. for AT-2005

ACCESSORIES AND REPLACEMENTS



ATGC-1 AT-2000 Ground Coil™ Accessory

- Trace and locate buried conductors like Highway Lighting Conductors, Main Electrical Feeds, Water Mains, Gas Mains, and Telephone Lines
- Low Cost
- Eliminates Direct Connection of Transmitter
- No access to the conductor required

B2024 BATTERY BOOSTER

24 V Nicad rechargeable battery for the T2200, will triple its output. For use on runs over one mile or when using the A2201 on runs over 200 ft. The B2025 recharger works in conjuction with the B2024.

Weight: 19 oz.

Fuse: Internal self resetting

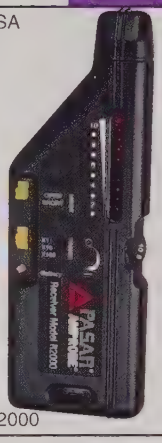
B2025 RECHARGER/CONVERTER

115VAC/24VDC Converter can be used to recharge the B2024 (allow 8 hours) or directly boost the T2200.

AT-2000 Series (cont'd)

COMPONENT DESCRIPTION & SPECIFICATIONS

USA



R2000

The **R2000 RECEIVER** has two detectors in its tip which are tuned to pick up the electromagnetic signals ('short' mode) or electrostatic signals ('open' mode) generated by the other components. The LED's and sensitivity settings indicate the relative signal strength to allow easy detection of the signal source. The R2000 is included in each of the five systems: AT-2001 through AT-2005.

R2000 Receiver
Detectors: Electromagnetic coil pickup for short mode.
Electrostatic plate pickup for open mode pick-up for open mode
Sensitivity Selection: x1, x10, x100 coarse gain adjustment; 0-10 fine adjustment
Short Mode Performance: Over 20' in air under test conditions.
Open Mode Performance: Over 12' in air under test conditions
60 Hz Rejection: 120dB
Power Source: 9V alkaline battery (Amprobe model MN-1604)
Display: 10 LED's with chroma filter lens
Case: Flame Retardant ABS 911

Note: The AT series is covered by one or more U.S. patents; 5,413,499; D356,039; D355,618; D355,619; 5,338,228. Other U.S. & foreign patents pending.

USA

T2200

The **T2200 TRANSMITTER** injects a signal into an unenergized conductor. If the conductor is broken (open), no current will flow, so the signal is present as a voltage pulse, which is detected along the conductor's length by the R2000's electrostatic detector ('open mode'). The signal will stop at the open. The T2200 comes with the AT-2003, AT-2004, and AT-2005

T2200 Transmitter
Operating Frequency: 32.768 KHz
Duty Cycle: Transmits 2 pulses with a duration of 0.0635 sec. each every 0.5 seconds.
Signal Output: 9V Supply 24 V Supply
High Setting: 1A, 31V 3A, 105V
Medium Setting: 1.8A, 13V 6A, 45V
Low Setting: 3.0A, 6.5V 10A, 22V
Fuse: Fast acting 2A @250V 3AG ¼" x 1 ½" Cat no. 2502-6X32
Battery: 9V alkaline (Amprobe Model MN-1604), 24V jack will accept battery pack accessory (B2024 or B2025)
Case: Flame retardant ABS911

USA

S2600

The **LOAD SIGNAL GENERATORS S2300 & S2600,** when connected to an energized line, will draw a rapidly fluctuating current pulse from the source, causing the power line to emit an electromagnetic signal which is detected by the R2000 Receiver in the 'short' mode. These devices allow tracing of line-side conductors without power interruption or interference. The S2300 will accept 9-300V AC or DC and comes with the AT-2001. The S2600 accepts 9-600V AC or DC and comes with the AT-2002, 2004, and AT-2005.

USA

S2300

S2300 Operating Voltage:
9-300 volts AC or DC
S2600 Operating Voltage:
9-600 volts AC or DC
Operating Frequency: 32.768 KHz
Duty Cycle: Transmits 2 pulses with a duration of 0.0625 sec. each every 0.5 second
Current Output -
Low Mode: 35mA peak, 4mA average
High Mode:70mA peak, 6mA average
S2300 Fuse: Fast acting 250mA @380V (6mm x 32 mm)
Cat. no. 380.25-6X32
S2600 Fuse: Fast acting 250mA @660V (6mm x 32 mm)
Cat. no. 660.25-6X32
Case: Flame retardant ABS 911

USA

A2201

When the **A2201 INDUCTIVE CLAMP** is clamped around an energized line with current flowingand plugged into the T2200 Transmitter, it will induce a signal onto the downstream (load) side to enable identification of equipment on that circuit. The A2201 comes with the AT-2004 and AT-2005.

A2201 Clamp-on Transmitter Accessory
Operating Frequency: 32.768 KHz as supplied by the T2200
Case Breakdown Voltage: 3000 Volts
Maximum Wiresize: 2000 MCM or 2" dia. cable
Battery: None, power is supplied by T2200

General
Operating Temperature: 0 to 120°F
Storage Temperature: -40 to 150°F
Case Material: ABS
Case Size: 11"x15½"x4" (39.4x27.9x10.2 cm)

MOTOR GUARD™ & PRM-1

FEATURES

- 5 Year Warranty with registration
- Adjustable Voltage Settings
- Operates independently of 3-Phase motor horsepower or current
- Trip/Reset delays avoid nuisance tripping
- Prevents motor restart until fault is cleared
- UL & ULc Listed
- Made in U.S.A.

PROTECTS 3 PHASE MOTORS FROM:

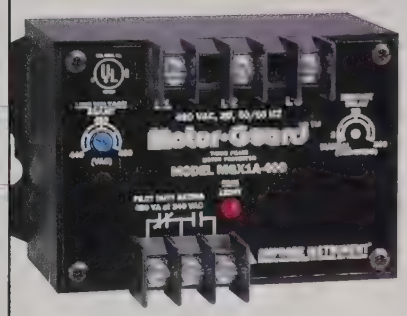
- Loss of any phase (single phasing)
- Low voltage (any or all phases)
- Phase Reversal
- Voltage Unbalance

SPECIFICATIONS

3-Phase Line Voltage (specify ranges):	MGX1A-200/400	208-240, 440-480 VAC
	MGX4A-400/600	440-480, 550-600 VAC
Frequency:	60 - 50 Hz*	
Low Voltage (% of set point):	Trip	90%
	Reset	93%
Voltage Unbalance (NEMA):	Trip	6%
	Reset	4.5%
Trip Delay Time:	Low Voltage	4 Sec.
	Unbalance & Phasing Faults	2 Sec.
Reset Delay Time:	After a Fault	2 Sec.
	From a complete power loss	5 Sec.
Output Contact Rating	(Pilot Duty): MGX1A-200/400 SPDT	480 VA @ 240VAC
	(Pilot Duty): MGX4A-400/600 SPDT	470 VA @ 600VAC (400 or 600 VAC)
Transit Protection:	(Internal)	2500V for 10mSec.
Repeat Accuracy:	Fixed Connection	±0.1%
Power Consumption:	5 Watts (Max.)	
Weight:	MGX1A-200/400	14 oz.
	MGX4A-400/600	1.5 lb.
Dimensions:	5.25"L x 2.66"W x 2.81"H (133.4mm x 67.5mm x 20.6mm)	

* Low Voltage trip level will be 1 or 2% lower at 50 Hz

USA



MGX-1A-400

FEATURES

- Low Cost
- Identifies Line Sequence and Motor Rotation
- Extremely simple to use
- Voltage Range from 20 to 600VRMS
- Frequency Range from 50-400Hz
- Four Bright LED Indicators
- Normal (ABC) indicator (Green LED)
- Reverse (CBA) Indicator (Red LED)
- Phase Loss Indicator (Red LED)
- Low Battery Indicator (Yellow LED)
- Integrated Test Leads
- Small and Compact Design
- Made in USA

SPECIFICATIONS

Operating Voltage:	20 to 600 VRMS
Operating Frequency:	50/60/400 Hz
Isolation:	3000 VAC
Operating Temperature:	32°F to 113°F (0°C to 45°F)
Storage Temperature:	-40°F to 140°F (-40°C to 60°C)
Power:	9V Alkaline - Amprobe Model MN-1604 (included)
Integrated Test Leads:	18" (45.72cm), color coded
Dimensions:	3.75" x 2.625" x 1.5" (9.53cm x 6.67cm x 3.81cm)
Instruction Sheet:	Part Number 921751 (included)

USA

PRM-1

Ask for more information on the following three phase and motor related products (found in this catalog):

AMC and AMB Series:	Megohmmeter/Insulation testers
Motor Guard™:	Three phase motor protection relays (shown above)
OT Series:	Optical Tachometers
CT and AT Series:	Ground Fault, Wire and Cable Tracers
AC/DC-3000:	True RMS clamp-on for Variable Frequency and DC Drive Voltage, Current, and Frequency measurements, data hold and record capability.
DLC-100 AC Leakage Current Clamp-On:	Clamp-on Milliammeter for "On-line" current leakage testing.
DM-II:	Three Phase Voltage and Chart Recorders/Data Logger
WH Series:	Three Phase and Single Phase KWH and KWH/Demand Submeters.
AC/DC-620T	True RMS AC/DC Clamp-on with Temperature and Capacitance measurement capabilities

GP-1

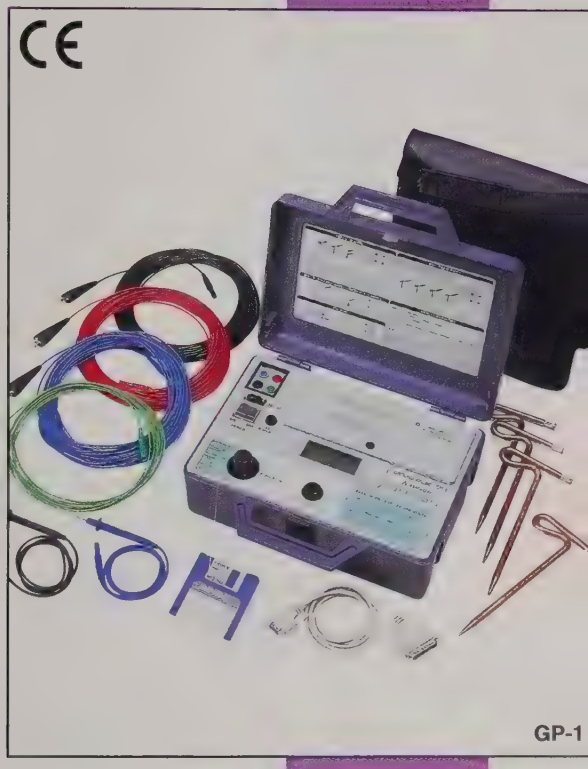
GP-1

FEATURES

- Measures Earth Ground Resistance (Ω)
- Automatically Calculates Resistivity (Ωm)
- Auto Ranging
- RS-232 Download
- 100 Memory Locations
- Water Resistant

The GP-1 is a rugged, battery operated, earth ground resistance tester that also automatically calculates resistivity and can download to a PC. 100 memory locations allow storage of two point, three point (fall of potential), and four point resistance/resistivity test results. The GP-1 also functions as a voltmeter up to 600VAC.

The GP-1 is a complete kit for testing existing earth ground electrodes to equipment manufacturer specifications or as mandated by National Electrical Code requirements of proper grounding, typically 25 ohms or less. The unit also tests soil resistivity for new ground system designs. Other testing applications include Cathodic Protection, Soil Contamination, Lightning Protection, and Isolated Grounding.


GP-1

SPECIFICATIONS

Resistance:

Range	Resolution
0-19.99Ω	0.01
20.0-199.9Ω	0.1
200-1999Ω	1
Accuracy:	+/-2% of reading + 2 Digits

Resistivity:

Range	Resolution
0-19.99Ωm	0.01
20.0-199.9Ωm	.1
200-1999Ωm	1
2.00k-19.9kΩm	10
20.0k-199.9kΩm	100
200k-314kΩm	1000

Accuracy: +/-(2% of reading + $2\pi a \cdot 0.02\Omega$); where $\frac{\rho}{2\pi a} \leq 19.99\Omega$

+/-(2% of reading + $2\pi a \cdot 0.2\Omega$); where $19.99\Omega < \frac{\rho}{2\pi a} \leq 199.9\Omega$

+/-(2% of reading + $2\pi a \cdot 2\Omega$); where $199.9\Omega < \frac{\rho}{2\pi a}$

Test current: <10ma$_{RMS}$ sinewave
Test Frequency: 135 Hz +/- 1Hz

VOLTAGE

Range:
0-600VRMS max +/-2% of reading + 2 Digits

Frequency Response: 60HZ +/-1%*

GENERAL

Fuse: 5 x 20mm, 32mA @250V fast blow, Amprobe Model 5 x 20-250.32
Input Power: (4) "D" cells, Amprobe Model MN-1300 (not supplied)
Display: 3 1/2 Digit LCD 3/4"(H)
Weight: 7.26 lbs (3.3kg)
Dimensions(WxHxL): 13.6" x 5.1" x 9.8" (34.5cm x 13cm x 25cm)
Nominal Temp Range: 41 - 95°F (5 - 35°C)
Working Temp. Range: 32 - 104°F (0 - 40°C)
Storage Temp. Range: 14 - 140°F (-10 - 60°C)

STANDARDS

Constructed according to: EN 61010-1
Ground resistance measurement: VDE 0413 Part 7
CE mark

GP-1 ACCESSORIES INCLUDED

Model GP-CS:	(1) 30' (10m) Green test cable (1) 30' (10m) Black test cable (1) 47' (15.5m) Red test cable (1) 77' (25.5m) Blue test cable
Model GP-MR	(4) 9" measuring rods
Model GP-TL	(1) Safety banana test lead set
Model GP-RS232	(1) 9 pin male to 9 pin female-RS-232 cable
Model GP-BP	(1) Black shoulder pouch
Download Software	

PF-1000 & TMOT-220

USA

PF-1000

FEATURES - PF-1000

- Measures volts, amps, or power factor with the flip of a switch, which will allow you to determine KVA, KW, KVAR and the exact value of capacitance needed to improve power factor.
- Measures power factor (leading or lagging) in 3-phase systems (balanced or unbalanced)
- Over-range indication
- Separate LED indicates leading power factor

SPECIFICATIONS

Power Factor:	30.0% to 99.9% (80.9% PF - .809PF) based on inputs of 80-550 VAC and of 10-999* amps AC.
Amps:	0-99.9/999 amps AC*
Volts:	0-99.9/999 volts AC *May be increased to 6,000 or 3,600 amps with Amptran CT-50-1 or CT-50-2. Accuracy may be affected up to ± 1% of reading when power factor is above 80%; up to ± 2% if power factor is below 80%.
Accuracy:	Based on sinusoidal waveform. Volts ± 1% of reading ± 2 LSD; Amps ± 2% of reading ± 2 LSD PF 90.0% to 99.9% ± 1% of reading: 70.0% to 90.0%±2% of reading + 2 LSD: 50.0% to 79.0% ± 3% of reading ± 2 LSD; 40.0% to 50.0% ± 3 ½% of reading; 30.0% to 40.0% ± 4% of reading ± 5 LSD.
Power:	PF1000 requires 120VAC 60Hz; PF1050 requires 240VAC 50HZ. Model PF1000 may be used with Model ADV220 adaptor for use on 240 VAC. For 12V DC battery operation, use Volt-o-Verter Model AI-1 or AI-3
Size:	7 1/2" x 7 1/8" x 7 1/4" (19.05cm x 18.1cm x 18.42cm)
Weight:	5 Lbs. (2.27Kg)

USA

TMOT-220

FEATURES

Measures RPM by directing an integral light source onto a reflective marker on the rotating object, counting light pulses reflected by each revolution, and by comparing them against a highly accurate crystal controlled time base.

- Convenient "pistol grip" design
- Safe and easy non-contact operation
- Wide range 50 to 20,000 RPM
- Accuracy and resolution ±1RPM
- 4 1/2 digit LCD display
- Can be mounted on a tripod
- "Last measurement" memory

SPECIFICATIONS

Speed range:	50 RPM to 20,000 RPM
Accuracy:	±1 RPM
Resolution:	1 RPM
Display:	4 1/2 digit, 0.4" high LCD
Display Update:	Once per second
On-Target Indication:	Steady illumination of plus sign indicated lock-on target
Operating Envelope:	Range 0 to 3' from reflective target
Angle:	Up to 45° from perpendicular to reflective target
Power-On Switch:	Pistol grip trigger. May be locked on with latching push-button for longer duration measurements
Optical System:	Single lens reflex. Visible light source
Time Base:	Crystal controlled
Power Source:	4 "AA" batteries. Recharger socket provide for optional rechargeable batteries

ACCESSORIES AND REPLACEMENTS

Carrying case with foam	MM-220
Reflecting tape (5' long, 1/2" wide)	TP-5
Battery charge and 4 ni-cad batteries	BC-7
208-240VAC 60Hz adaptor for BC-6	ADV-222
Battery charger and 4 ni-cad batteries for 220V, 50Hz	BC-750
Instruction Book (PF-1000)	P/N 981670
Instruction Book (OT-220)	P/N 912653

Model TMOT-220 contains OT-220, reflecting tape TP-5, package of 4 "AA" rechargeable batteries and battery charger BC-7 packed in carrying case MM-220.

KW/HR METERS

FEATURES

- +/- 1% Accuracy
- 2, 3 and 4 wire
- Delta and WYE
- Pre-wired for fast installation
- 25 Year Warranty
- CT's included
- Pulse output optional
- Wide voltage range from 120V to 600V
- Wide current range up to 4000A
- Digital display
- No need for battery back-up
- Rugged housings
- Totalization packages available
- Unbreakable Poly-Carbonate covers
- Non-combustible bases
- Wide temperature range
- Lower magnetic bearing design

SPECIFICATIONS

key: (N) = non demand
(D) = demand

Electrical Specs

PHASE CONFIGURATIONS:		Delta and Y
PHASES OFFERED:		Single and Polyphase
SELF CONTAINED V(max)	(N)	600
	(D)	575
DIELECTRIC VOLTAGE SURGE:		2500v for 1 min.
ACCURACY OVERLOAD RANGE		+/-1%(1-400%FL)
MEMORY BACKUP SOURCE:	(N)	unnecessary
	(D)	unnecessary
LINE V REGULATION ALLOWED		+/-20%
FREQUENCY (Hz)		50 or 60
OPERATING TEMP C		-40 - +70
OPERATING TEMP F		-40 - +158
TRANSDUCER OFFERED:		SOLID XFMRS
		INDUSTRY STD (5A SEC)
CURRENT RANGE (A)		100-4000
RECOMMENDED METER TO		1-4 ft (14 AWG)
TRANSDUCER LENGTH W/A.W.G.		4-25 ft (12 AWG)
		25-100 ft (10 AWG)
UL SPECS		MEETS UL 1244
ANSI		C12.1
I.E.C.		521

General Specs

MANUFACTURED		USA
WARRANTY (YRS)	(N)	25
	(D)	25(EXCLUDES ELECTRONICS)

Mechanical Specs

SIZE (H"XW"XD")	3 PHASE (N)	13.5X7X5.5
	3 Phase (D)	13.5x7x5.5
	1 Phase (N)	9x5x5
WEIGHT (lbs.)	(N)	10
PREWIRED		yes
DISPLAY TYPE:	(N)	6 digit mech. register
	(D)	6 dig reg w/sweep hand pointer
DISPLAY RESOLUTION:	(N)	0.001
	(D)	0.03
MULTIPLIER		yes
METER MOVEMENT PRINCIPLE	(N)	Magnetic Bearing
	(D)	Magnetic Bearing
READOUT DIGIT SIZE(in):	(N)	0.315
HOUSING	(D)	0.15
COVER	(N)	Polycarbonate
	(D)	Bakelite/Glass
BASE	(N)	Bakelite
	(D)	Bakelite
OPERATION INDICATOR:	(N)	Aluminum disc
	(D)	Aluminum disc
	(D)	Aluminum disc
	(D)	Aluminum disc
RESET BUTTON	(N)	no
	(D)	yes
OUTDOOR USE		yes with NEMA 3R enclosure
NEMA ENCLOSURE SIZE		(H)16"x(W)12"x(L)6"
AVG. INSTALL TIME (min.)		20

Contact factory for part numbers

HOW TO SELECT A KW/HR METER

How To Select The Correct Amprobe Kilowatt-Hour Meter Model Number

Amprobe's line of watt-hour meters are prewired for the specific voltage(s) and transformer wiring configuration to save time in installation. Since they are generally not interchangeable with other voltage applications, the correct selection of the appropriate model number is crucial. To help select the appropriate model number, use the following transformer schematics and voltage measurements to help identify your system. Then decide if you want a Demand or Non-Demand meter and select the appropriate current rating of the meter.

Selecting "Demand" or "Non-Demand"

In addition to kilowatt-hours, the measurement "Peak" demand in kilowatts over a 15 minute interval can be captured by a "Demand" meter. To select a "Demand" meter, insert the letter "M" after the WH. To select a "Non-Demand" meter and capture kilowatt-hours only, do not insert the "M" and leave this space blank. For example model number WH-M-1V1A4WY is a 120/208V Demand Meter. Model WH-1V1A4WY is a 120/208V "Non-Demand" meter.

Selecting the Current Rating of the Meter

All Amprobe KWH meters are supplied with industry standard 5A secondary solid core current transformers (CT's) in order to conform to ANSI standards. The use of split core transformers are not recommended in watt-hour metering because of the inaccuracies that may result from the excessive phase shift caused by the split CT's themselves, particularly at light loads.

The selection of the current rating of the meter should correspond to the maximum current rating of the panel to be measured or to the current interrupt device of the load to be measured.

The number before the "A" in the model number is the maximum current rating in hundreds of amps. i.e. 1=100A, 2=200A, 4=400A etc. To select the maximum current rating of the meter, insert a number before the "A" in the model number. The number of CT's provided with the meter is 1 less than the amount of wires; a 2-wire meter will have one CT, a 3-wire meter will have two CT's, a 4-wire meter will have 3 CT's.

Kw/Hr Meter Current Transformer Mechanical Specifications

AMPS	CORE I.D."	CORE O.D."
100	1.00	2.47
200	1.00	2.47
400	1.56	3.56
600	2.50	4.56
800	3.25	5.67
1000	4.25	5.95
1500	4.25	5.95
2000	4.25	5.95
3000	6.31	8.50
4000	8.25	9.05

Multiplier

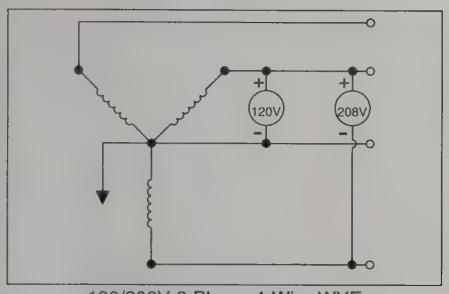
To obtain the amount of kilowatt-hour or "Peak" Demand in kilowatts, the meter readout must be multiplied by an associated multiplier that is stamped on every meter. The multiplier is simply the CT ratio. A 100a meter would come with 100A:5A CTs and would have a multiplier of 20. A 200A meter would come with 200A:5A CTs and would have a multiplier of 40 and so on.

Fuses

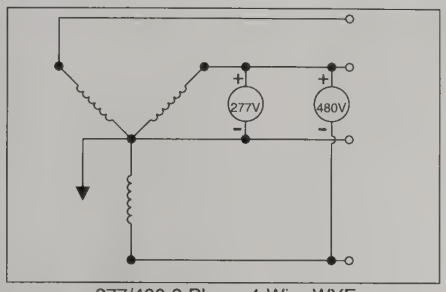
All meter voltage connections should be fused and installed on conformance to the NEC and local electrical codes. We recommend using 3A in line fast blow at the rated voltage (not supplied). Fuses must be installed for warranty to be honored.

HOW TO SELECT A KW/HR METER

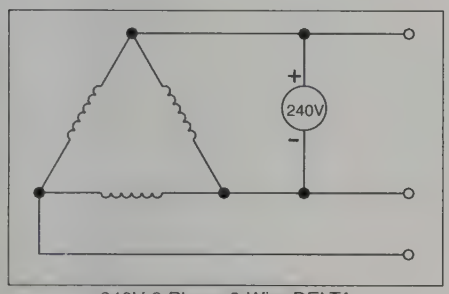
Three Phase KWH Meter Model Number System



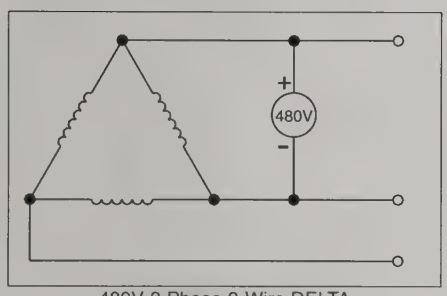
120/208V 3 Phase 4-Wire WYE
MODEL: WH-__-1V__A4WY



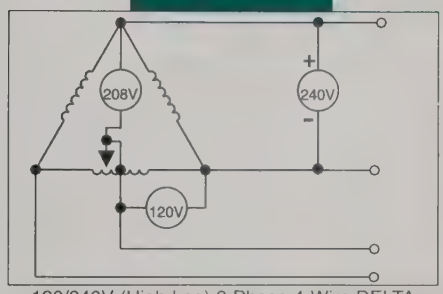
277/480 3 Phase 4-Wire WYE
MODEL: WH-__-2V__A4WY



240V 3 Phase 3-Wire DELTA
MODEL: WH-__-2V__A3WD

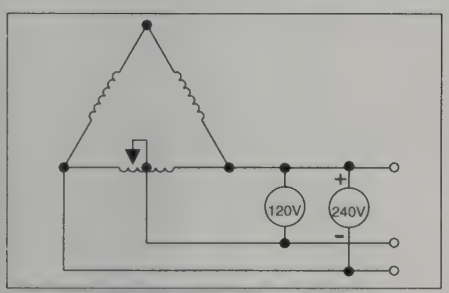


480V 3 Phase 3-Wire DELTA
MODEL: WH-__-4V__A3WD

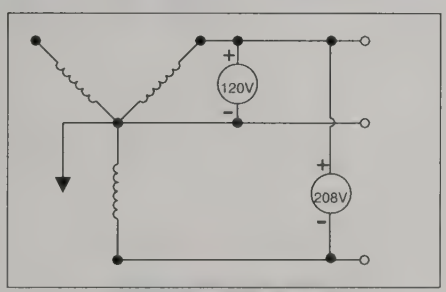


120/240V (High Leg) 3 Phase 4-Wire DELTA
MODEL: WH-__-1V__A4WD

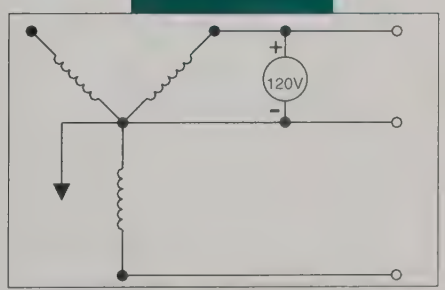
Single Phase KWH Meter Model Number System



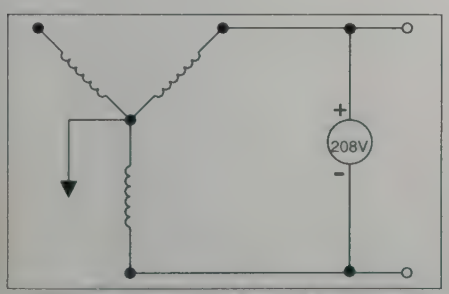
120/240V Single Phase 3-Wire
MODEL: WH-2V__A1P3W



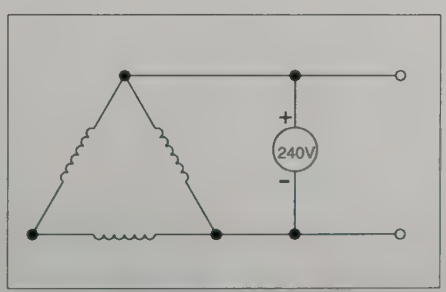
120/208 Three Wire Network
MODEL: WH-1V__A3WN



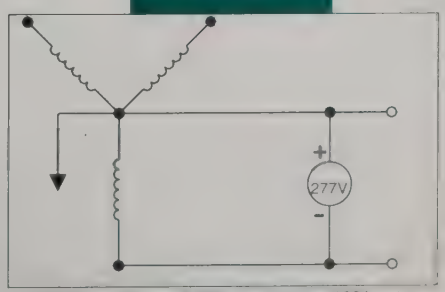
120V Single Phase 2-Wire (available in 100A only)
MODEL: WH-2V1A1P2W



208V Single Phase 2-Wire (available in 100A only)
MODEL: WH-2V1A1P2W



240V Single Phase 2-Wire
MODEL: WH-2V1A1P2W



277V Single Phase 2-Wire (available in 100A only)
MODEL: WH-2V1A1P2W

HARMONALYZER™

HA-1000 & HA-2000

FEATURE

Analyzes building wiring to determine power factor and the extent of distortion generated by non-linear equipment.

Helps determine the source of nagging power quality problems.

Record 'Volt/Amp signatures' of equipment such as motors to aid in preventative maintenance.

Displays:
- •Individual harmonics to the 31st. (HA 2000-computer download)
- •Two cycles of the waveform
- •All power data (watts, vars, PF, etc.) (HA-2000 only)

Stores 21 waveforms in memory
Downloads all data to your PC (software included) (HA-2000 only)

HA-2000
Harmonalyzer™

SPECIFICATIONS

RANGES:	**Voltage**	1-600 Vrms AC/DC 1000 Volts peak
	Current	1-1000 Amps rms AC
	Power	0-600 Kilowatts (HA-2000 only)
Frequency Readout		40-65 Hz
HARMONICS:	**HA-1000**	First 19 odd harmonics plus THD
	HA-2000	First 19 odd harmonics plus THD displayed on unit; first 31 harmonics plus THD when down loaded to your PC using the *Harmona-Link™* software
ACCURACIES:	**True RMS**	Voltage ±2% of reading Current ±2% of reading (without current transducer)
	Harmonics%	Voltage ±2% +6 LSD * Current ±2% +6 LSD * THD (>1%) ±1% of reading +3 LSD * *when fundamental (f) is 60Hz ±0.1 Hz
	Power	Watts, VA, VARs, ±2% of reading PF, dPF ±0.01
	Frequency	±0.1 Hz
MEMORY:		21 non-volatile, user-addressable, protected locations. Powered by non-user serviceable lithium cell with an expected life of eleven years.
DOWNLOAD:		EIA-232-E (RS-232) Interface via RJ-11 (HA-2000 only) telephone jack. Optically isolated, 9.6K baud rate *Harmona-Link™* II software: 3 1/2" floppy disk, MS-DOS® 3.3 or greater, and Windows 3.1/95; 1.4M required. Provides full harmonic analysis (to 31st) along with crest factor, form factor, K factor and power data.

Note: HA-1000/HA-2000 are designed to measure harmonic distortion on 60Hz & 50Hz Electrical Systems. Fundamental frequence is user selectable.

DISPLAY Super twisted liquid crystal with adjustable contrast. Backlight (HA-2000 only)
GENERAL Auto-Off, Auto Ranging
UNIT SIZE: 8.62" x 3.50" x 1.76" (219x89x50mm)
UNIT WEIGHT: 1.22 lbs (0.55 kg)
CASE SIZE: 11" x 15 1/2" x 4" (394 x 279 x 102mm)
WEIGHT: **(HA-2000 KIT)** 4.56 lbs (2.069 kg)
OPERATING CONDITIONS: 32° to 122° F (0° to 50° C) RH <85%
Storage Conditions: -4° to 140° F (-2° to 60° C) RH < 90%

BATTERY: Six alkaline 'AA' cells, ANSI/NEDA 15A, IEC-LR6
LIFE: 24 hrs continuous with backlight off 8 hrs continuous with backlight on.
INSTRUMENT CASE MATERIAL: Flame retardant ABS911
CURRENT TRANSDUCER: #HACT-1 or HACT-2 supplied*
RANGE: 1-1000A
FREQUENCY: 20-2000Hz (HACT-2), 40-400 HZ (HACT-1)
OUTPUT: 1mV AC per 1 Amp AC
ACCURACY: ±1% of reading
CASE BREAKDOWN VOLTAGE: 3000V
JAW CAPACITY: 2 " dia. or 2000 MCM
OUTPUT LEADS: 3.5 mm phono jacks
VOLTAGE LEADS: 1000V rms maximum

* Other Transducers available.

USA

HA-2000

ACCESSORIES AND REPLACEMENTS

Catalog # HA-1000 includes:
HA-1000 *Harmonalyzer™*, MTL-15 voltage leads, HACT-1 Current transducer, HA3R Memory pad & pencil and HACC carrying case.

Catalog # HA-2000 includes:
HA-2000 *Harmonalyzer™* , HAVL-2 voltage leads, HACT-2 Current transducer, HADAPT Data cord, *Harmona-Link™* II software (HADISC) HA3R Memory pad & pencil and HACC carrying case.

Intruction Book
P/N 79-0010-00

HACT-1/10 & HACT-100/1

HACT-1/10

FEATURES - HACT-1/10

Designed as an accessory to the Harmonalyzer™, the HACT-1/10 has:

- 3000 Amp capacity
- Exceptionally large jaws that can accommodate bus bars and multiple conductors

The Harmonalyzer™ will display 1/10 the actual reading, so you must multiply the Harmonalyzer's reading by 10.

SPECIFICATIONS

Maximum Current:	3000 Amps
Minimum Current:	5 Amps
Signal Output:	1 Amp = 0.1 mV
Accuracy:	±1% of reading
Frequency Range:	40 Hz to 2000 Hz
Phase Shift:	8 to 26 minutes (1° = 60 min)
Uninsulated conductor:	650 Volts max.
Case Breakdown Voltage:	4000 Volts
Internal Impedance:	3 Ohms
Load Impedance:	30,000 Ohms min
Operating Temperature:	-10° to 50°C
Termination:	1/8" phono plug
Size:	5 1/4" x 13 1/8" (133mmx333mm)
Weight:	3.716 (1.68 Kg)
Safety:	Conforms to IEC 348

HACT-100/1

FEATURES - HACT-100/1

Designed as an accessory to the Harmonalyzer™, the HACT-100/1 has:

- 50 milliAmp resolution for accurate reading on low current applications like the 0-5 Amp secondaries from permanent CT's
- Small size, to allow easier placement and measurement in constricted areas

The Harmonalyzer™ will display 100 times the actual reading, so you must divide the Harmonalyzer's reading by 100.

SPECIFICATIONS

Maximum Current:	10 Amps
Minimum Current:	0.050 Amps
Signal Output:	1 Amp = 100 mV
Accuracy:	±1% of reading
Frequency Range:	40 Hz to 2000 Hz
Phase Shift:	2.6° - 3.2°
Uninsulated conductor:	650 Volts max.
Case Breakdown Voltage:	4000 Volts
Internal Impedance:	300 Ohms
Load Impedance:	30,000 Ohms min
Operating Temperature:	-10° to 50°C
Termination:	1/8" phono plug
Size:	1.69"x3.58" (42.9mm x 90.9mm)
Weight:	.342 lb. (155 g)
Safety:	Conforms to IEC 348

LTP-1

FEATURES

All objects emit measurable infrared energy. The LTP-1 uses special optics to gather infrared energy from a target surface and focuses this energy onto a custom detector. At that point, the detector will convert the infrared energy into an electrical signal proportionate to the temperature of the target surface. The final outcome is a digital temperature measurement in degrees Fahrenheit or Centigrade.

The LTP-1 is easy to operate. Simply point at the desired target and press the "on" button for a temperature reading - no contact is ever needed. The LTP-1 has a first temperature response time of 1 second and a continuous reading feature for thermal scanning.

USA

LTP-1

SPECIFICATIONS

Temperature Range: 0-600°F or -18° -315°C
Operating Temperature Range: 50° - 125°F or (10° - 52°C)
Resolution: 1°F (1°C)
Accuracy: ±2% of Full Scale or 3°F/2°C (whichever is greater)
Response time: 1 second
Target Size/Field of View: 3:1 optics ratio with a 1" min target
Repeatability: ±0.5% of reading, plus one digit
Power Source: 9-volt alkaline battery (Mμ -160μ) supplied
Wavelength: 8 to 14 micron
Dimensions: 7.26" x 1.7" x .75"
Weight: 2.7 oz (without battery)
Emissivity: Fixed at .95
Carrying Cases: P/N #LTP-CC Supplied

APPLICATIONS

ELECTRICAL
- Check temperature of high voltage equipment and transformers from a safe distance
- Detect heating of problem fuses, wires, insulators, connectors, splices, switches, neutrals
- Overload motors due to possible Harmonic currents

HVAC/REFRIGERATION
- Furnace exteriors, steam traps, heat exchangers
- Take suction LINE TEMPERATURES FOR SUPERHEAT
- Ambient temperature
- Outlet air
- Inlet air
- Refrigeration equipment, freezers and display cases

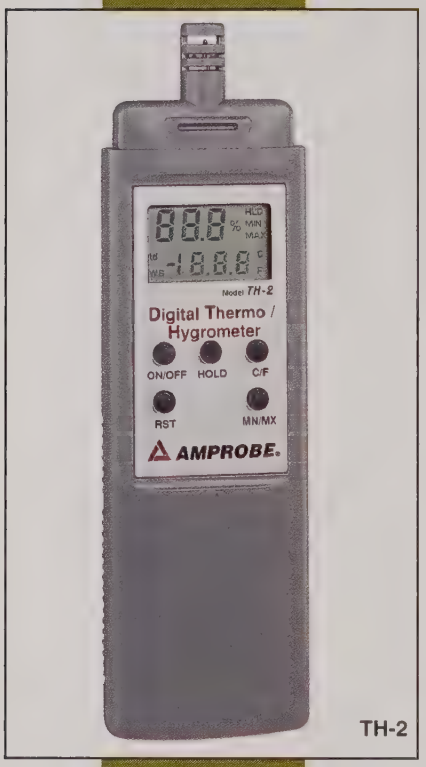
MECHANICAL
- Rotating motors and other machinery
- Energy surveys
- Boiler operations and steam systems
- Performance verification of machinery and equipment

AUTOMOTIVE
- Detect overheating electrical components, connectors and wiring harness
- Pinpoint radiator core restrictions
- Temperature sensors
- Catalytic converters
- Exhaust systems

TEXTILES
- Permanent press
- Heat setting
- Dye setting
- Foam lamination
- Carpet backing

TH-2 & THWD-1

FEATURES - TH-2 & THWD-1



TH-2

- Temperature in °F or °C
- Humidity
- Min/Max
- Auto Power Off (20 Min)
- Dew Point (THWD-1 Only)
- Data Hold
- Wet Bulb (THWD-1 Only)
- Low Battery Indicator
- Cover Protects Sensor and Acts as a Handy Pocket Clip (Not shown)

APPLICATIONS
- HVAC/R
- INDUSTRIAL
- LABORATORIES
- HOSPITALS
- GENERAL USE

THWD-1

SPECIFICATIONS

Type of Display:	LCD, Fully Annunciated Dual Display
Temperature Range:	**THWD-1 -** -4 to 122°F; -20° to 50°C **TH-2 -** +14 to 122°F; -10° to 50°C
Accuracy:	±1 °F, ±1 °C
Resolution:	0.1% F, 0.1% C
Humidity (RH):	**THWD-1 -** 0 to 100% R.H. **TH-2 -** 5 to 95% R.H.
Accuracy:	**THWD-1 -** ±3% @ 25°C from 10% to 90% R.H., ±4% all other ranges **TH-2 -** ±3% @ 25°C from 10% to 90% R.H., ±5% all other ranges
Memory:	Min/Max
Response Time:	**THWD-1** 60 seconds typical **TH-2** 80 seconds typical
Battery:	2, AAA Alkaline, included
Battery Life:	500 hours
Size:	0.66" (H) x 1.9" (W) x 6.7" (L) 16.8 mm (H) x 48.5 mm (W) x 170 mm (L)
Data Hold	
F/C Switch	
Wet Bulb Temperature:	Updated every 5 min. (THWD-1 only)
Dew Point Measurement:	(td) (THWD only)
Auto Power Off:	(20 min), Can also be disabled for unlimited time measurement
Low Battery Indicator	
Sensor Cover with Pocket Clip	
Instruction Book (THWD-1)	P/N 975750
Instruction Book (TH-2)	P/N 975751

ULD-300

FEATURES

The AMPROBE ULD-300 Ultrasonic Leak Detector is a compact, high quality and affordably priced ultrasonic leak detector that is a solution for many leak detector problems.

The ULD-300 "hears" the ultrasonic noise created by any gas moving through a small orifice. This method of detection enables the ULD-300 to pinpoint leaks of any gas, regardless of type.

- Detects any pressurized gas leak, regardless of type: CFC's, HFC's, Nitrogen, etc.
- Unaffected by contaminants.
- Unaffected by windy, roof-top conditions.
- The ULD-300, when used in conjunction with the Parabola PB-1, will dramatically reduce the background noise.
- Detects the ultrasonic noise caused by arcing electrical switchgear.

Combined with the AMPROBE UT-300 Transmitter, the ULD-300 has a variety of applications:

- Testing the "air-tightness" of cars and houses
- Pre-pressure testing of vessels
- Identifying the ends of buried PVC pipe
- Finding leaks in ductwork

USA

ULD-300

SPECIFICATIONS

Weight:	5.6 oz. (160 grams) with battery	**Battery Test:**	LED Color indicating Green - Good Red - Replace
Dimensions:	Height: 2-1/2" Length:		
Frequency Response:	35KHz to 45Khz+6dB	**LED:**	High intensity for outdoor visibility
Power Consumption:	22mA at 9 Volts DC		
Battery Life:	9-Volt Alkaline Batteries. 33 hours	**Case:**	High impact ABS
Performance:	Meets the A.S.T.M Standard		

UT-300

In areas where leaking gases are not sufficently pressurized, there is no ultrasonic sound for detection. The area can be "pressurized" with the ultrasonic sound waves created by Amprobe's UT-300 Ultrasonic Transmitter. This will allow the detection of cracks which would not normally be possible.

TMULD-300

The TMULD-300 contains all the accessories necessary to locate a multitude of leaks. The kit includes the ULD-300 Leak Detector, UT- 300 Transmitter, TE-2 Tubular Extension with adapter, HP-1 Headphones, PB-1 Parabola and the carrying case (ULD-CC).

UT-300

TMULD-300

ACCESSORIES AND REPLACEMENTS

Ultrasonic Leak Detector	ULD-300
Ultrasonic Tansmitter	UT-300
Tubular Extension Adapter	TEA-2
Tubular Extension	TE-2
Carrying Case	ULD-CC
ParabolA	PB-1
Headphones for ULD-300	HP-1
9-Volt Battery	MN1604
Instruction Book	P/N 937793

VCM-2 & CVF-3

FEATURES

The VCM-2 and CVF-3 are pocket sized instruments that will safely indicate AC voltage using Non-Cont method. In addition there are several other features and capabilities.

- AC Voltage Non-Contact Tester
- Direct Contact AC Voltage Tester (CVF-3)
- DC Voltage/Polarity Checker
- Metal Detector (VCM-2)
- Battery Checker
- Continuity Tester
- Microwave Leakage Detector

VCM-2

SPECIFICATIONS - VCM-2 AC VOLTAGE TESTER

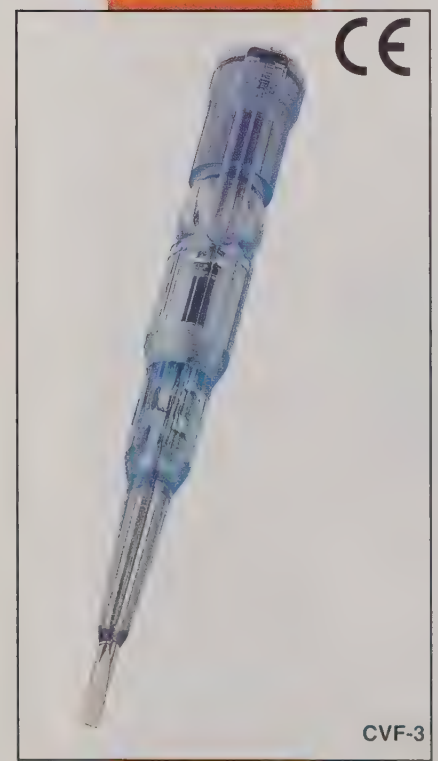
- Adjustable distance sensitivity and sensing arm (0-90°)
- Continuity 0-5MΩ (with an audible sound adjustment)
- Verify DC voltage/polarity check - 2-36VDC
- AC voltage test - Non-contact (70-600VAC) with adjustable distance sensitivity
- Microwave leakage monitor - ≥5mW/cm²
- Negative Ions Detector (Ionizer Detector)
- Indication - Audible and Visible
- Maximum Depth on Metal Detection is 1-1/2"
- Batteries - 4 LR44 1.5V

The VCM2 is a non-contact AC voltage detector that helps distinguish between live and neutral wires. It helps you sfaely find "Breaks/Opens" in cables and has an audible and visible indicator for AC voltage check.

Why wait until your lights go out? With the VCM-2, you can check fuses and bulbs and replace them before they burn out. It also can verify DC voltage and check electronic components.

An extra feature for your safety, the VCM-2 can locate metal conduit, water or gas pipes. With the VCM-2 you can accurately trace buried cable.

Another important feature that will interest the average consumer is that the VCM-2 can detect microwave leakage.



CVF-3

SPECIFICATIONS - CVF-3 ALL WEATHER TESTER

• AC Voltage Test	:Contact method from 70-250VAC :Noncontact method fom 70-600VAC
• DC Voltage Test	:1.5 to 250VDC
• Polarity Test	:1.5V-36VDC
• Continuity Check	:0-50MΩ
• Microwave Leakage Detection	:≥5mW/cm²
• Batteries Replacement	:Type - 392A; AG3; LR41; 192; V3GA (1.5V x 2 Alkaline or Silver type)
• Battery Life	:Min. 5 hours of continuity operations

The CVF-3 has an added feature. It is an all weather tester that is for contact and non-contact testing, and can determine polarity and continuity.

Detects AC Power (non-contact testing)

Test AC Voltage (contact testing)

Detects Microwave Leakage

Tests Bulbs & Fuses

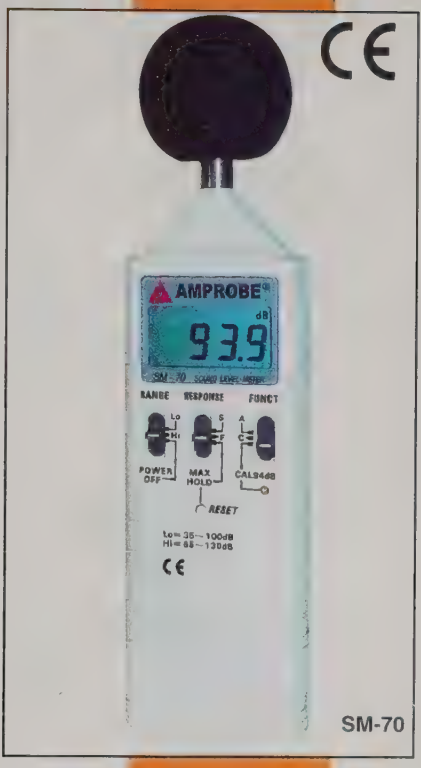
Locates "Break or Open" Point

Verifies DC Polarity

SM-70, CAL-SM

FEATURES - SM-70 Soundmeter

- Designed to meet IEC65I, ANSI S1-4
- Measuring range from 35dB to 130dB with an accuracy of ±2dB at 94dB
- A and C weightings for checking compliance with safety regulations as well as acoustic analysis
- Fast and slow response settings to check peak and average noise levels
- 3-1/2" digital LCD display w/0.1 dB resolution
- Maximum hold: used to measure the peak sound levels
- Low battery indicator
- Over and under range indicator
- DC signal output for data analysis and recording (10mV/dB)



SM-70

SPECIFICATIONS

Standard applied:	Designed to meet IEC651, ANSI S1.4
Frequency range:	31.5Hz ~ 8Khz
Measuring level range:	35 ~ 130dB
Frequency weighting:	A/C
Microphone:	1/2 inch Electret condenser microphone
Display:	LCD
Digital display:	4 digits
Resolution:	0.1dB
Display period:	0.5 sec.
Time Weighting:	FAST (125mS), SLOW (1 sec.)
Level ranges:	Lo: 35 ~ 100dB and Hi: 65 ~ 130dB
Accuracy:	±2.0dB (under reference conditions)
Dynamic range:	65dB
Alarm function:	"OVER" is shown when input is out of range
Maximum hold:	Hold readings, with decay < 1dB/3 minutes
Calibration:	Electrical calibration with the internal oscillator (1kHz sine wave)
AC output:	0.65 Vrms at FS (full scale) output impedance approx. 600Ω
DC output:	10mV/dB, output impedance approx. 100Ω
Power supply:	One 9V battery MN1604
Battery Life:	About 50 hrs. (alkaline cell)
Operating temperature:	32° to 104° F (0 to 40°C)
Operating humidity:	10 to 75% RH
Storage temperature:	-10 to 60°C (14 to 140°F)
Storage humidity:	10 to 75% RH
Dimensions:	9.36"(L)x2.61"(w)x.975"(H) - 240(L) x 6(W) x 25(H) mm
Weight:	.462 lb. (210g including battery)
Accessories:	9V battery, carrying case, screwdriver, instruction manual, 3.5 φ plug.

FEATURES - CAL-SM Sound Level Calibrator

- Easy one-handed operation
- Conforms to ANSI SI.40 -1984 and IEC942 1988 Class 2.
- A constant sound level is generated at fixed frequencies: 94dB and 114dB
- Perform "before and after" calibration checks as suggested by standards
- Fits 1/4, 1/2, & 1" microphones

CAL-SM

SPECIFICATIONS

Output Sound - Pressure Levels: 114dB and 94dB re 20 uPa under reference conditions.
Output Frequency: 1000Hz ±4%
Temperature Coefficient: ±0.01dB/°C
Total Harmonic Distortion: <3%
Accuracy of Sound-Pressure Level: ±0.5dB
Power: One 9V battery MN1604
Battery Life: Approx. 100 hours (alkaline Battery)
Battery Test: Internal circuitry checks condition of battery continuously. Calibrator will not operate if battery voltage falls below acceptable level.
Dimensions: 103(L) x 63 (W) x 54 (H)mm
Weight: Approx. 200g (battery included)
Operating Temperature & Humidity: 32 to 104°F (0 ~ 40°C), 10 ~ 90%RH
Storage Temperature & Humidity: 14 to 140°F (-10 ~ 60°C), 10 ~ 70% RH
Accessories: Instruction manual, carrying case, 9V battery, 1/2" and 1/4" Microphone adapter

PY-1, 2, 3, 4 & 5

PY-1

FEATURES

PY-1 High Voltage Tester AC/DC

- AC Volts 115/220/277/400, DC Volts 125/300/400/600
- Automatically indicates voltage of circuit under test
- 4 neon bulb indictor lamps

PY-2

FEATURES

3 Wire 110V AC Circuit Tester with G.F.C.I.

- Gives instant display of receptacle wiring condition for any standard 110V AC outlet
- Checks the condition of G.F.C.I. protected circuit
- UL approved

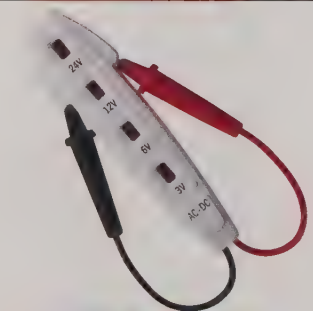
PY-3

FEATURES - PY-3

3 Wire 110V AC Circuit Tester

- Gives instant display of circuit condition for any standard 110V AC outlet
- UL approved

PY-4



FEATURES - PY-5

Low Voltage Tester

- AC/DC 3/6/12/24V
- Automatically indicates voltage under test
- 4 LED indicator lamps

PY-5

FEATURES - PY-5

Pen Type Voltage Tester LED AC/DC

- AC 110/220/380V
- DC 150/300/500V
- LED indicators
- Dual insulated probes

PY-6, 7, 8, 9 & 10

FEATURES - PY-6

PY-6 Electronic Multi-Test Tool

- Detects live power source without actual contact with cables
- Tests for circuit continuity
- Tests live circuits and indicates whether the supply is AC or DC
- Determines polarity on DC and battery circuit
- Incorporates audio signal and indicator lights.
- 9V Battery Supplied

PY-6

FEATURES - PY-7

Voltage Tester 80-500V

- AC/DC 80 to 500V
- Dual indicator lamp

PY-7

FEATURES - PY-8

Solenoid Voltage Tester

- AC 1202/240/277/480/600V
- DC 120/240/600V
- Solenoid plunger indicates level of voltage supplied

PY-8

FEATURES - PY-9

Metal/Power Sensor

- Electronically locates live cables, gas and water pipes and all other hidden metal objects
- Incorporates dual purpose control for sweep searching and precise tracing
- Differentiates between live cables and metal pipes, a chirp will be heard and the lamp will flicker if it detects a voltage, a constant audio signal and a steady indication will appear when it detects a metal object
- Helps prevent accident or injury when drilling or sawing in walls
- 9V Battery Supplied
- Incorporates two tone audio signal and indicator light with sensitivity adjustment control

PY-9

FEATURES - PY-10

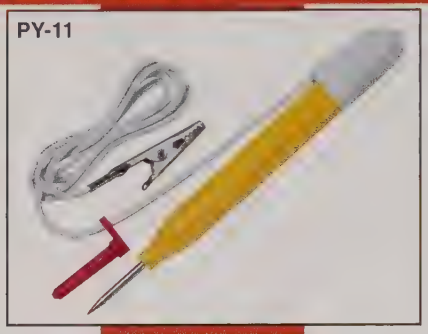
Low Voltage Circuit Tester 9-50V AC/DC

- AC/DC 9 to 50V
- Insulated alligator clips
- Neon bulb indication

PY-10

PY-11, 12, 15, 17, 18

PY-11

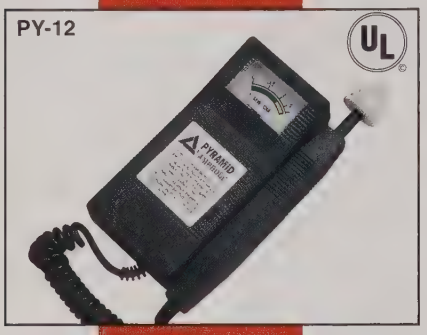


FEATURE - PY-11

Continuity Tester

- Bulb lights when circuit is completed
- Do not use on live circuits
- Batteries included (AAA Size)
- Replacement Bulb P/N

PY-12



FEATURES - PY-12

Microwave Leakage Detector

- Detects microwave leakage around doors on microwave ovens and other microwave emitting sources
- Color coded indicator scale for easy reading
- With handy probe

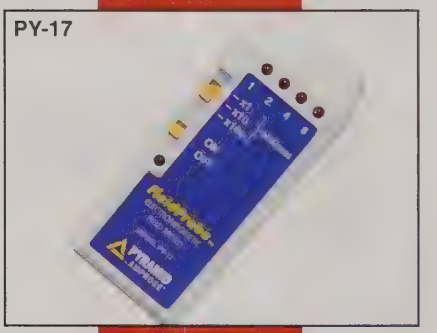
PY-15

FEATURES - PY-15

Digital Thermometer Degrees C & F

- Displays Temperature in °F or °C -40 to 300°F, - 40°C to 150°C
- On/Off switch
- Data Hold
- Water resistant
- Drop resistant
- Protective sheath with a pocket clip
- 3 minute auto power shut-off
- Battery included

PY-17

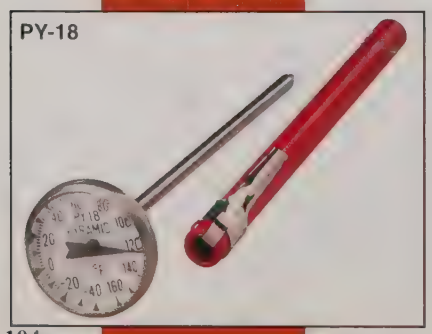


FEATURES - PY-17

Field Probe™

- Electromagnetic Field Meter
- Size: 2.54"W x 5.83"L x 1.16"D
- Weight: 4.20 oz. (119.07 gms)
- Battery: 9V (not supplied)
- Ranges: All ranges measured in milliGauss x 1, x10, x100 measurements of 1mG to 800 mG
- Frequency: 60 Hz
- U.S. Patent: 5,413,499

PY-18



FEATURES - PY-18

Analog Thermometer

- Displays Temperature in Degrees Fahrenheit (°F)
- Range: -40° to 160°F
- Pocket Clip with Sheath

PY-19, 20 & VP-440

PY-19 Analog Thermometer

- Displays Temperature in Degrees Fahrenheit (°F)
- Range: 0° to 220°F (2°F Resolution)
- Pocket Clip with Sheath

PY-20 Digital Thermometer

- Displays Temperature in Degrees Fahrenheit (°F)
- Range: -58° to 302°F (1°F Resolution)
- On/Off Switch
- Pocket Clip with Sheath
- Uses Battery 393 not supplied

VoltProbe 440®

- Check AC Voltage without disconnections:
  - Cable
  - Circuit Breakers
  - Wall Sockets
  - Junction Boxes
  - Fuses
- Totally insulated, no exposed metal or conductive parts
- Detects 110-600 Volts AC
- Includes two AAA 1.5 Volt batteries and instructions

ADS-1, RG3300 & RG3305

ADS-1

FEATURES - ADS-1

Charging & Recovery Scale

- LCD Display in Pounds & Kilograms
- Capacity 176 lb. (80 Kg)
- Accuracy + 1% of reading
- All Refrigerant Capable
- Two-piece Design
- Rugged Compact Design for Field Use
- Zero Scale at Any Point to Measure Change of Weight
- Comes Complete with a 9 Volt Alkaline Battery and Carrying Case
- Calibrated to Standards Traceable to the National Institute of Standards and Technology (N.I.S.T.)
- Weight 7.2 lbs. (3.26 Kg)

RG3300

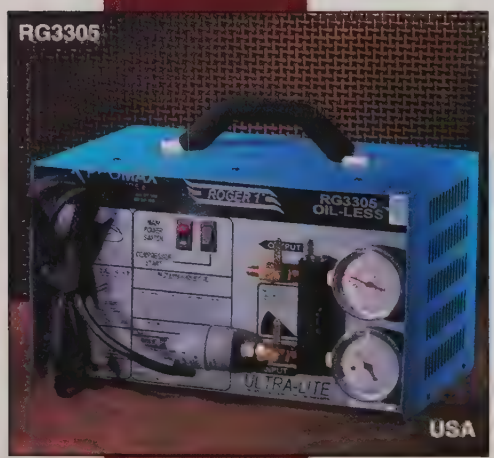
USA

FEATURES - RG3300

"Oil-less" Compressor System

Weight: 35 lbs.
Recovers new and old refrigerants: One unit does it all!
Compatible with synthetic and mineral oils. Compact and portable. Recovery rates up to 1.3 lbs. per minute vapor and upt to 3 lbs. per min. liquid straight through the compressor. When connected in push-pull mode, up to 16 lbs. per minute (using 3/8" hoses, up to 10 lbs. per minute using 1/4" hoses). The **ROGER 1**™ RG3300 OIL-LESS will automatically handle liquid or vapor. The most unique characteristic of this unit is the low noise, air cooled, direct drive 1/2 H.P. refrigerant recovery compressor that operates without an oil bath. The RG3300 OIL-LESS, like all of the recovery units manufactured by AMPROBE/PROMAX, is in full compliance with the EPA. In addition, the RG3300 OIL-LESS features twin fans, extra large condenser, sensor lights, in-line filter and automatic tank shut-off. (Includes 30 lb. Tank with sensor).

RG3305



USA

FEATURES - RG3305

Ultra-Lite "Oil-less" System

Weight: 29 lbs.
Recovers new and old refrigerants. Compatible with synthetic and mineral oils. Compact and portable, extremely lightweight. Recovery rates up to 1.2 lbs. per minute vapor and up to 3 lbs. per minute liquid straight through the compressor. When connected in push-pull mode, up to 14 lbs. per minute (using 3/4" hoses, up to 10 lbs. per minute using 1/4" hoses). Refrigerant management will never be easier with the **ROGER 1**™ RG3305 ULTRA-LITE. The direct drive, 1/2 H.P. refrigerant compressor operates without an oil bath making this unit the lightest and most user friendly model in the market today. (Tank not included).

RG5000, RG5000A & DVG1000A

FEATURES - RG5000

"Oil-less" Refrigerant Recovery

A rugged, double wall molded case is easy to carry and is quieter in operation. The AMPROBE/PROMAX™ RG5000 has the easiest two-hose refrigerant recovery system in the industry. This one-connection system provides automatic, straight-through, liquid or vapor operation. It also provides a "self-evacuate" feature for easy change over to all common refrigerants. This proven oil-less compressor is direct-driven with an appliance duty 1/2 H.P. standard rpm motor. The air-cooled recovery compresssor has a 400 p.s.i. shut-off. Recovery rates up to 1.2 lbs. per minute vapor and up to 3 lbs. per minute liquid straight through the compressor. When connected in push-pull mode, up to 14 lbs. per minute (using 3/8" hoses, up to 10 lbs. per minute using 1/4" hoses). The unit weights only 29 lbs. and includes built-in gauges and manifold with filter. The RG5000 is ARI approved and is also available in U.L. model. Size: 13.5 x 9 x 19 inches or 343 x 229 x 483 mm.

RG5000

FEATURES - RG5000A

"Oil-less" Automotive System

Weight: 35 lbs.
Air cooled compressor pumps both old and new refrigerants including the new blends up to 400 psi. In addition, this unit pumps both mineral oil and the new synthetic refrigerant oils. Recovery rates up to 3 lbs./min liquid and up to 1.3 lbs./min vapor. When connecged in push-pull mode, up to 16 lbs./min using hoses. The RG5000A refrigerant recovery units achieves the fastest production in its class and pulls a 26" vacuum.

RG5000A

USA

FEATURES - DVG1000A

Digital Vacuum Gauge

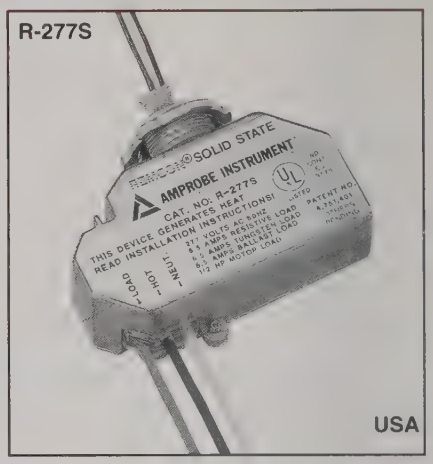
The DVG1000A digital vacuum gauge is a versatile and essential tool for the Service Engineer that will mesaure a vacuum in 50 micron increments. It incorporates a high precision temperature compensated pressure sensor along with an integrated programmable controller that is fully temperature, drift and gain compensated. The gauge displays vacuum in three units: Microns, inches of Hg and psia. The DVG1000A is a high accuracy gauge with a resolution of 50 microns, 0.001 psia or 0.002 inches Hg increments for measuring deep vacuum.

DVG1000A

R-277S, RC-120S, R-115S

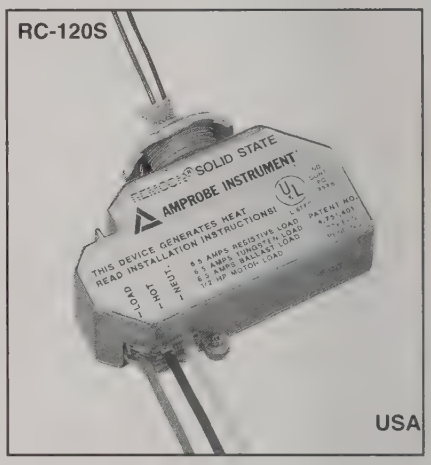
FEATURES

- Industrial Control Applications
- Where isolated low voltage is needed for safety reasons
- Higher current applications (up to 6.5 Amps, ½ HP)
- Long-distance remote operation
- Alarms
- Computer control applications
- Plant process controls
- Hostile or hazardous environments
- Reduce control wiring costs and electrical interference
- Economically meet building codes in new installations
- Applications where a U.L. Listed device is required



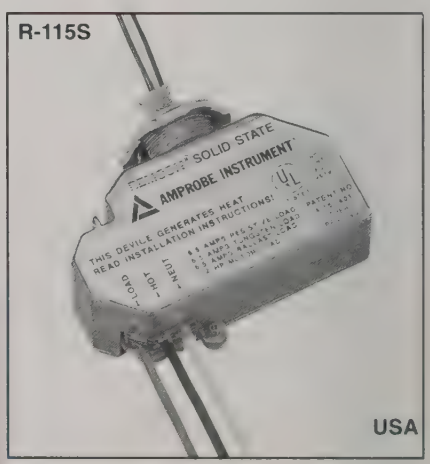
SPECIFICATIONS - R-277S (only)

- AC voltage rating: 240 to 300 VAC, 50-60 Hz
- AC current rating: 6.5 Amps Max. Resistive, Tungsten, or Ballast Load, 1/2 HP Max. Motor Load at 277 VAC
- Control switching current: 10 Milliamps Max.
- Control switching voltage: 10 VDC Max. (isolated from AC line)
- Control switch closure time: 5 Milliseconds Min.
- Ambient operating temperature: 40°C Max. for full rated output
- Operation: Momentary contact closure of control wires turns AC power ON or OFF



SPECIFICATIONS - RC-120S (only)

- AC voltage rating: 105 to 125 VAC, 50-60 Hz
- AC current rating: Resistive, Tungsten, 6.5 Amps max. at 120 VAC, 1/4 HP Motor Load
- Control switching current: 10 Milliamps Max.
- Control switching voltage: 10.0 VDC isolated from AC line
- Control switch closure time: 5 Milliseconds Min.
- Ambient operating temperature: 40°C Max. for full rated output current
- Operation: Contact closure of control wires turns AC power ON



SPECIFICATIONS - R-115S (only)

- AC voltage rating: 105 to 125 VAC, 50-60 Hz
- AC current rating: 6.5 Amps Max. Resistive, Tungsten, or Ballast Load, 1/4 HP Max. Motor Load at 120 VAC
- Control switching current: 10 Milliamps Max.
- Control switching voltage: 10 VDC Max. (isolated from AC line)
- Control switch closure time: 5 Milliseconds Min.
- Ambient operating temperature: 40°C Max. for full rated output
- Operation: Momentary contact closure of control wires turns AC power ON or OFF

ACCESSORIES AND REPLACEMENTS

Switch Plate, 1 gang	SPR-1
Switch Plate, 2 gang	SPR-2
Switch Plate, 3 gang	SPR-3
Solderless connector	STA-1
Switch, momentary contact, gangable	RE-SW
Complete data sheet with diagrams	RD-67
Instruction Book (R-277S)	P/N 957754
Instruction Book (R-115S)	P/N 957753
Instruction Book (RC-120S)	P/N 957750
Mounting Bracket	MB-1

GLOSSARY

- A -

AC, Abbreviation for alternating current.

Accuracy, The extent to which the measured value of a quantity agrees with the accepted, consensus, or true value of that quantity. The accuracy of a measurement is its "closeness" to a defined true or reference value. For example, a measurement that is uncertain by ±1% is 99% accurate. Accuracy, however, is also sometimes used to mean uncertainty.

Ampere (Amp), A measure of electrical current.

Analog, Data which is displayed by continuously variable physical quantity, rather than discrete steps.

Analog Bar Graph, A digital display that simulates the movement of the needle of a mechanical (analog) meter.

Analog Meter, A mechanical measuring device using a needle moving across a graduated scale or dial.

Analog-to-Digital Converter, A circuit module that changes a voltage or current into a digitized number that can be displayed or further analyzed by digital circuitry.

Autoranging, The capability of an instrument to automatically select the most appropriate range in response to an applied stimulus or requested output.

Average Responding, A measurement that uses the DC average of the rectified AC which is scaled to indicate RMS value. In the case of a pure sine wave the DC is multiplied by 1.11 to indicate the RMS value.

- B -

Bandwidth, The range of frequencies within which performance remains within specified limits.

Burden Voltage, Voltage drop across the input terminals of a current-measuring device, caused by internal shunt resistance. Burden voltage contributes measurement error, and should be as low as practical.

- C -

Capacitance, Measurement of a capacitor storage capacity, usually stated in microfarads.

Capacitor, Electronic component which stores electrons and then discharges them; blocks DC and allows AC to pass thru.

Certificate of Calibration (Traceable to NIST), At the customer's request, traceability to NIST for an individual instrument can be established at the factory. As evidence of traceability, MIL-STD-45662A Certificate of Calibration, and a printout of outgoing readings are provided.

Chart Recorder, Gives a paper graph or a function (volts, amps, watts, KWH) versus time (5 min. to a month).

Clamp-On, A type of meter or adapter that fits around a conductor to measure AC or DC current without breaking the circuit.

Common Mode Rejection, For a measurement device, the ability to measure a signal in the presence of common mode noise. For a source device, the maximum level of common mode noise that might appear on the output terminal. Common mode rejection is normally specified as a ratio (dB).

Compliance Voltage, The output voltage of a constant-current source. For a current calibrator, a "maximum compliance voltage" specification defines the load limit for which the calibrator can maintain uncertainty specifications.

Conductance, A measure of how easily a substance passes an electrical current; the reciprocal of resistance; conductance = 1/resistance; measured in siemens.

Continuity, The continuous path for flow of electrons in closed circuit.

Crest Factor, The ratio of the peak voltage of an AC waveform to its rms value, with an DC component removed. For an alternating voltage or current meter, crest factor expresses its ability to respond to non-sinusoidal; waveforms.

CT, Current transformer.

Current, The flow of an electrical charge through a conductor; measured in amperes.

Current Probe, An accessory to a multimeter or oscilloscope that allows reading and display of current without breaking the circuit (see Clamp-On meter).

Cycles, Segment of AC signal where current travels from zero to a positive peak down through zero to a negative peak and returns to the same amplitude as at the start.

- D -

DB, Decibels.

DBM, A power level compared to a reference of 1MW, {DBM = 10 log (P/.001)}.

DC, Direct current; a unidirectional, steady voltage.

Digital Multimeter (DMM), An instrument that displays current, voltage, and resistance, as discreet number.

Diode, Electronic device in circuits that allows current to flow easily in only one direction and blocks flow in the opposite direction.

Distortion, Undesired changes in waveform of a signal. Harmonic distortion disturbs the original relationship between a frequency and other frequencies naturally related to it. Intermodulation Distortion (MD) introduces new frequencies by the mixing of two or more original frequencies. Other forms of distortion are phase distortion and transient distortion.

Display Hold, When a digital meter continues to display the last reading even after the probes have been removed from the test circuit.

- E -

Earth Tester, Used to measure the resistance of a ground rod, steel tower, or actual earth ground.

Electromagnetic Interference (EMI), Stray electrical or magnetic fields that may induce damaging current or interference in other electrical equipment.

- F -

°F, Degrees fahrenheit.

Farad, A unit used to measure capacitance (see Microfarad).

Frequency, The number of recurrences of a periodic phenomenon in a unit of time.

Full Scale, The upper limit of measurement or source value for which a given uncertainty specification applies, including any "overrange". Also see Overrange, Range.

- G -

Gauss, Electromagnetic unit of magnetic induction. One gauss represents one line of flux (one maxwell) per square centimeter.

Ground, A large conducting body (earth) used as a common return for electrons in a circuit, and is at arbitrary zero potential.

Ground Fault Circuit Interrupter (GFCI), A safety device that disconnects power from a circuit when a potentially dangerous electrical condition exists. A GFI protects people while fuses or circuit breakers protect equipment.

- H -

Hall Effect Probe, A semi-conductor device that measures a magnetic field. Used in clamp-on meters to read DC current.

Hertz, One Hertz is one cycle per second.

Hygrometer, Measures humidity in the atmosphere; reads out as relative humidity. May also measure and display temperature.

- I -

Input Impedance, Opposition to current flow through a test instrument, measured in ohms; a high value means less disturbance to the circuit being tested.

Insulator, A substance that offers extremely high resistance to current flow.

- L -

LCD, Liquid crystal display.

LED, Light emitting diode.

Liquid Crystal Display, A digital display that uses very little power and, has high contrast (LCD).

GLOSSARY

LSD, Abbreviation for the Least Significant Digit; the rightmost digit in a display.

- M -

Manual Ranging, The user must select the proper range on a measurement instrument (see Auto Ranging).

Megohmmeter, Insulation tester; an ohmmeter capable of measuring very high resistance (over 1,000 megohms).

Microfarad, One millionth of a farad. The typical measurement unit of capacitance.

Multimeters, Measure voltage, current, and resistance. There are two types: analog and digital. Either type is available in bench or hand-held models. Analog Meters have a mechanical method of displaying the applied signal which is better for observing changes, adjusting for peak or dip, and for instantaneous response. Digital Meters give a visual indication which is represented as a discrete number that provides greater accuracy. Key parameters of multi-meters are: voltage, current, and resistance ranges: number of digits displayed (digital only); resolution, and accuracy. Functions available: DC and AC voltage, resistance, conductance, DC and AC current, diode check, frequency, temperature, and data hold.

- N -

Non-Sinusoidal Wave, Any wave that is not a sine, wave, such as a triangular, square or pulse wave.

Normal Mode Rejection (NMR), The ability of a device to filter out a noise signal that is on both the positive and negative input lines.

- O -

OHM, Unit of electrical resistance.

Overrange, An extension to the nominal upper limit of a measurement or source device for which a given uncertainty specification applies, often given in percent. For example, the uncertainty specification for the 10V range of an instrument with "100% overrange" applies up to 20V. Also see Range, Scale.

- P -

Peak Voltage, In an alternating waveform, the maximum excursion from the zero reference point.

Phase, Time relationship between the current and voltage in AC circuits; position of a sine wave on the time axis. Abbreviation for phase is: Ø.

Potential, The difference between two points.

Power Factor, The ratio of real power (watts) to the apparent power (volt amps).

Psychrometer, An instrument that measures relative humidity.

Pyrometer, An electronic device that can measure a wide range of temperature (typically -100 to 1999°F); especially high temperatures.

- R -

Range, Stated upper limits of measurement or source values for which given uncertainty specifications apply. Also see Overrange, Scale.

Reference Impedance, A value used when defining absolute values such as DBM; 1 DBM = 1mW at 600 ohms impedance.

Relative Humidity, The ratio of the quantity of water vapor in the atmosphere to the quantity of water vapor that would saturate the atmosphere at the existing temperature.

Resistance, A measure of the opposition to current flow; measured in ohms.

Resolution, The smallest increment in value that can be detected and displayed by a measurement system or displayed and generated by a calibration source.

RMS (Root-Mean-Square), For voltage or current, the value assigned to a level equal to that of a direct voltage (current) producing the same power dissipation through a pure resistance. "RMS" is also applied to many other parameters.

RS, Rotary scale.

RS-232C, An EIA-defined standard for a serial communications interface commonly used between computers, terminals, and modems.

- S -

Sampling, The process of obtaining a sequence of values of a signal. Sampling may be at regular or intermittent intervals.

Sampling Rate, The number of times that a particular data channel is sampled by a commutator in one second.

Short, Any connection having relatively low resistance or impedance: an intentional interconnection of terminals for test or calibration purposes, or any resistance between two points below a preselected threshold.

Shunt, External device that provides a low resistance path for direct measurement of large currents. Used to extend the range of an ammeter.

Siemen, A unit of conductance equal to the inverse ohms; siemens = 1/ohms.

Sine Wave (Sinusoidal), A wave that can be described by graphing a trigonometric sine function.

Sinusoidal, Stable wave form of an undistorted alternating current or voltage.

- T -

Temperature Coefficient, A factor used to calculate the change in indication or output of an instrument with changes in temperature. Uncompensated changes in temperature contribute to instrument uncertainty by an amount determined by the temperature coefficient.

Thermistor, A resistor that is sensitive to temperature changes. It will change in resistance as a function of changing temperature.

Thermocouple, Converts (heat) into a low level DC voltage to measure temperature.

Threshold, A point or value above which something will take place and below which it will not take place.

Transducer, Converts an input (electrical or non-electrical) to an electrical output examples are a strain gauge or thermo couple.

True RMS, A circuit used for measuring AC signals to obtain the effective heating value. The RMS value of an AC waveform is equivalent to the DC value which would produce the same heating in a purely resistive load. A True RMS circuit makes accurate measurements even if the waveform is non-sinusoidal.

- V -

Volt, A measure of electromotive force, electrical potential or pressure.

Volt-Amperes, A representation of apparent power in an AC circuit.

Volt-OHM Meter (VOM), A device that will measure either voltage or resistance.

- W -

Watt, A unit of electric power measuring the rate at which energy is converted to work or dissipated as heat.

APPLICATION BRIEFS TRMS vs. AVERAGE SENSING

AVERAGE SENSING, RMS INDICATING: An instrument with this type of AC measuring system measures the average of a sine wave, then multiplies this value by 1.112 to allow the instrument to indicate RMS. This measuring system is called *Average sensing, calibrated to the RMS of a sine wave*. This measuring system is accurate ONLY on sine waves!

RMS SENSING, RMS INDICATING: An instrument with this type of AC measuring system computes the RMS value of the measured waveform (sine or other wave shape). This is referred to as "True RMS" reading. This measuring system is accurate for ANY waveform, sine or otherwise!

A method of determining if you have Harmonic Distortion on your system is to take an Average measurement AND a TRMS measurement. If these measurements are the same value, you are reading a sine wave. If these measurements are different values, Harmonic Distortion is present.

While different measured values indicates the presence of Harmonic Distortion, no conclusion can be drawn as to the severity of the problem. In an effort to attach a severity level to these measurements, a couple of math relationships have been suggested. One suggestion involves the ratio of AVERAGE/TRMS. If this ratio is 1, then the measurement was of a sine wave. If this ratio gets to 0.5 (or lower), severe distortion is present. Another suggestion is what is termed the "Harmonic Index" (HI)> HI = (TRMS-AVG.) / TRMS x 100. From this, one can see that equal readings (TRMS & AVERAGE) will yield a "0" and that non-equal readings will yield a percentage value. The higher the percentage, the worse the distortion.

While these methods attempt to indicate the severity of a problem only an instrument designed to do a complete Harmonic Analysis can.

READING and INTERPRETING AMPROBE RECORDER STRIP CHARTS

Most AMPROBE strip charts have multiple full scale values. This allows one chart to serve an instrument with more than one range or multiple instruments. While this cuts down on the number of charts necessary for a given recorder, it can also lead to confusion in reading the chart. The following will apply to all charts with linear, equally spaced divisions. These are called linear charts. This information cannot be applied to non-linear charts.

Before a chart is used for recording it must be "defined". To define a chart, write the following information on it after it is installed in a recorder:

(A) Chart Speed in use (i.e. 12"/hr, 1"/hr, etc.).
(B) Time of day recording was started.
(C) Range (or span)* selected on recorder (i.e. 150 Volts, 60 Amps, etc.).
(D) Accessories being used (i.e. A50-1, CT50-1 or 2, etc.)

To determine a reading on a chart, proceed as follows:

(A) Determine the number of divisions (lines) on the chart. (300SVA has 30 divisions, 850D has 50 divisions, 835X3A has 35 divisions, etc.)
(B) DIVIDE the number of divisions on the chart INTO the RANGE (or span)* selected. This will yield a "per division value" (i.e. 60 Amp Range/30 Divisions = 2). This means EACH is worth 2 Amps.
(C) Count the number of divisions to where a dot was made on the chart. Multiply the number of divisions counted by the per division value (2). This will give you the value of the variable measured (i.e. 8 divisions x 2 = 16 Amps). This is the actual measured value, provided no accessories were used.
(D) If any accessories were used, their division factor (i.e. 10 for A50-1 or 50 for CT50-1) will now be used as a multiplier (i.e. 16 Amps x 50 = 800 Amps).

This procedure will work on any chart that is linear. The total number of divisions may change (30, 35, 40, 50 etc.) but the procedure remains the same.

*NOTE: If a chart does not start at zero, its "SPAN" must be used in place of "RANGE" (i.e. 835X3A, one span is 190 to 260V, thus the "SPAN" IS 70 volts divided by 35 divisions = 2V per division value. 2V x 8 Div = 16V + 190V = 206V actual reading).

If there are any questions please call the AMPROBE TECHLINE @ 1-800-477-8658

REPAIR MANUALS

Repair Manual	Model	Repair Manual	Model
AAO-37	RS Series	AMO-78	AM-4B
AA0-40	All Juniors	AMO-79	AM-1E, AM-2E, AM-2EDP
AAO-53/58	ACD-1, ACD-2, ACD-3, ACD-4	AMO-80	AM-3E
AAO-65	ACDC1000	AMO-82	AM-14
AAO-60	DM-I Digimatic	AMO-84	AM-71
AAO-61	ACD-10	AMO-85	AM-90/AM-91
AAO-65	ACDC1000	DTO-69	DT-156
AAO-75	ACD-7, ACD-8, ACD-9 (not A versions)	FTO-51	Fastemp
AAO-77	FS-3, FS-3C	PFO-71	PF-1000, PF-1050
AAO-78	AC/DC-610, AC/DC-600A/AT, CT-600AC/DC	REO-42	Non-Time Sharing, Non-Take-up Recorders
ACO-70	CC-1000, CC-1050	REO-54*	Time Sharing Recorders
AMO-83	AMB-1A, AMB-2	REO-57	Take-up Single Channel Recorders
		REO-61	Take-up Electronic Time Sharing Recorders
AMO-64	AM-2B, AM-2BDP, AM-2BB, AM-2BBDP	REO-62*	Take-Up Time Sharing Recorders
AMO-74	AM-12	REO-66	Time Sharing Strip Chart Recorders
AMO-76	RS-3SG		

* Does not include electronic versions

CONTACT AMPROBE CUSTOMER SERVICE TO PURCHASE THESE REPAIR MANUALS

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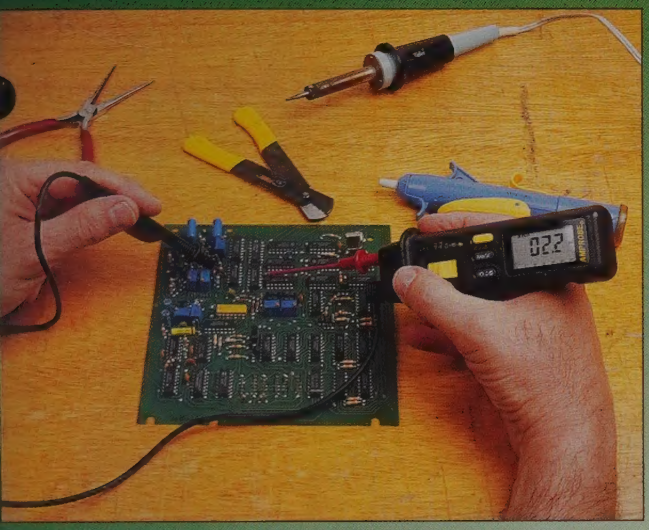
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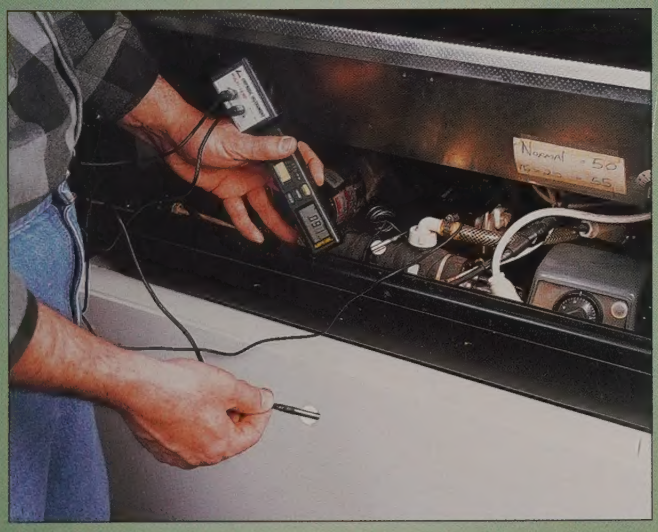
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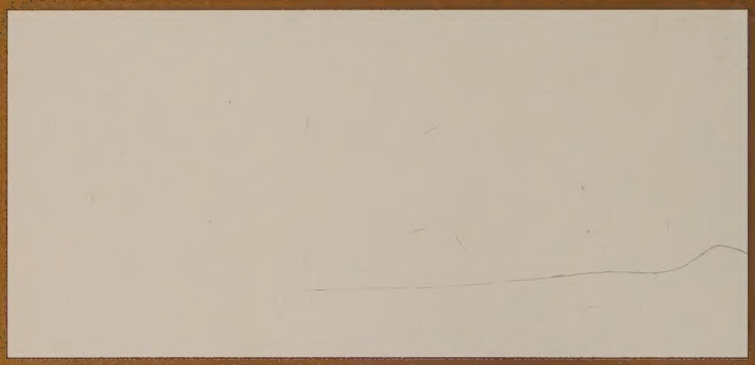

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